Vol. 1067 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

June 10, 1986

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Mar. 31, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 7, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,386,437 through 4,387,470
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 23, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,320,557	06/217,921	3/23/82
4,320,616	06/217,617	3/23/82
4,320,711	06/266,962	3/23/82
4,320,717	06/250,345	3/23/82
4,320,756	06/237,869	3/23/82
4,320,778	06/241,593	3/23/82
4,320,902	06/237,369	3/23/82
4,321,056	06/220,998	3/23/82
4,321,100	06/247,567	3/23/82
4,321,124	06/230,756	3/23/82
4,321,197	06/219,629	3/23/82
4,321,210	06/263,823	3/23/82
4,321,269	06/218,746	3/23/82
4,321,270	06/229,415	3/23/82
4,321,276	06/254,337	3/23/82
4,321,326	06/238,288	3/23/82
4,321,360	06/265,701	3/23/82
4,321,383	06/277,299	3/23/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,431,518, Re. S.N. 839,665, Filed Mar. 14, 1986, Cl. 208/111, HIGH NITROGEN-CONTAINING OIL PROCESSING, Philip J. Angevine, et al., Owner of Record: *Mobil Oil Corp., Fairfax, Va.,* Attorney or Agent: Alexander J. McKillop, Ex. Gp.: 116

4,439,387, Re. S.N. 842,191, Filed Mar. 21, 1986, Cl. 264/108, METHOD OF MANUFACTURING A COMPOSITE REINFORCING STRUCTURE, Ronald C. Hawley, Owner of Record: *Polymer Composites, Inc., Winona, Minn.,* Attorney or Agent: Malcolm L. Moore, et al., Ex. Gp.: 137

4,483,280, Re. S.N. 831,521, Filed Feb. 20, 1986, Cl. 123/046 SC, PORTABLE GAS-POWERED TOOL WITH LINEAR MOTOR, Milovan Nikolich, Owner of Record: *Signode Corp., Glenview, Ill.,* Attorney or Agent: Talivaldis Cepuritis, Ex. Gp.: 342

4,510,281, Re. S.N. 853,342, Filed Apr. 17, 1986, Cl. 524/229, TACK-FREE POLYMER PELLETS, Malcolm Seaborn Smith, Owner of Record: *E. I. Du Pont de Nemours and Co., Wilmington, Del.,* Attorney or Agent: Paul R. Steyermark, Ex. Gp.: 155

4,531,289, Re. S.N. 853,422, Filed Apr. 18, 1986, Cl. 030/134, HIGH-POWER RESCUE TOOL, Francis M. Brick, Owner of Record: *F. M. Brich Industries, Inc., Horsham, Pa.,* Attorney or Agent: William H. Eilberg, Ex. Gp.: 324

4,543,345, Re. S.N. 847,961, Filed Apr. 3, 1986, Cl. 501/095, SILICON CARBIDE WHISKER REINFORCED CERAMIC COMPOSITES AND METHOD FOR MAKING SAME, George C. Wei, Owner of Record: *United States of America as represented by the United States Department of Energy, Washington, D.C.,* Attorney or Agent: Earl L. Larcher, et al., Ex. Gp.: 118

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Establishing Common Ownership of Patent Applications and/or Patents Owned by a Corporation or Other Organization

This notice is intended to simplify the practice of establishing common ownership of patent applications and/or patents in circumstances where the common owner is a corporation or other organization. Under 37 CFR 1.104(e), in order to establish common ownership "[i]n circumstances where the common owner is a corporation or other organization an affidavit or declaration may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization." A mere power of attorney to prosecute a patent application does not make an individual an official of a corporation or organization or empower the individual to act on behalf of the corporation or organization in making an affidavit or declaration averring to common ownership. However, such an affidavit could be made by a patent attorney, patent agent, or other individual if the attorney, agent, or other individual has been appointed in writing by the corporation or organization as an official of the corporation or organization specifically empowered to make affidavits or declarations on its behalf averring to common ownership. In circumstances where such a written appointment has been given to a patent attorney, patent agent, or other individual, that person could then make affidavits or declarations averring to common ownership as long as the affidavit or declaration referred to an attached copy of the written appointment and averred that the authority is still in effect. Under this practice the original signed copy of the written appointment would be retained by the affiant or declarant unless the Patent and Trademark Office specifically required it to be filed. Unless some question arose as to the authority of the individual to make the averment as to common ownership, the Patent and Trademark Office would ordinarily not need to require the original signed copy of the written appointment. While this practice should simplify the establishing of common ownership by necessitating only one original signed written appointment, corporations and other organizations must exercise care that the written appointment is only given to those persons who are in a position to know that common ownership does in fact exist and can therefore properly make affirmative representations to that effect to the Patent and Trademark Office.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patent and Trademarks.

May 12, 1986.

Patents Available for License or Sale

The inventions listed below owned by Bernhard Kirsch are available for licensing or sale. Please contact

Bernhard Kirsch, Im Litzelholz 23, 5500 Trier, West Germany, or Beach & Brown, 3107 Eastlake Avenue East, Seattle, Wash. 98102 (206) 325–6789.

4,017,098. SAFETY BINDINGS FOR SKIS.
4,113,276. SKI BINDING AUTOMATICALLY RELEASABLE BY OVERSTRESS.
4,169,612. SKI BINDINGS.
4,173,084. SKI BOOTS.
4,226,439. SAFETY SKI-BINDINGS.
4,294,460. FOOT-PLATES FOR SKI-BINDING.
4,484,764. FRONT BINDINGS FOR SAFETY SKI BINDINGS.

4,557,471. MEDICAL BED. *Norbert Pazzini,* 31340 Villemur sur Tarn, France.

4,581,135. SELF-CLEANING FLUID FILTER WITH A DRAIN. *Henry C. Kovar,* P.O. Box 571, Anoka, Minn. 55303 (612) 421–6120.

4,583,956. RIGID AND TELESCOPING STRUT MEMBERS CONNECTED BY FLEXIBLE TENDONS. *William A. Nelson,* 52 High St., Middlebury, Vt. 05753.

SN# 692,342. MINI MAC. *Ernesto MacNamara,* 5701 N.W. 110 St., Hialeah, Fla. 33012.

SN# 692,571. ENVELOPE. *Kenneth M. Garrett,* 390 Bay St., Suite 812, Toronto, Ontario, Canada M5H 2Y2.

Withdrawal of Availability

4,500,824. METHOD OF COMMUTATION AND CONVERTER CIRCUIT FOR SWITCHED RELUCTANCE MOTORS. *General Electric Co., John M. Stoudt,* 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind. 46801–2204. (219) 428–3287.

Subscription Pricing Information

The subscription prices on the following publications have been changed as indicated below:

Title: Official Gazette, Patent Section

First-class domestic mailing	$384.00
Fourth-class domestic mailing	270.00
Fourth-class foreign mailing	337.50
Single copies each, domestic	18.00
Single copies each, foreign	22.00

Title: Official Gazette, Trademark Section

First-class domestic mailing	246.00
Surface mailing, foreign	307.50
Single copies each, domestic	5.50
Single copies, foreign	6.88

This change is effective with Government Periodicals and Subscription Services Price List 36, dated Summer, 1986.

Foreign first-class mailing rates will be furnished upon request. Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order. Subscriptions can also be charged to your Master Charge or VISA, include your Account Number and expiration date.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

May 15, 1986.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

David Brown Shoe Co., Inc., Baltimore, Md., Reg. No. 920,269 for the mark "POW WOWS", Canc. No. 15,143.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Intersphere Corp., San Francisco, Calif., Reg. No. 918,261, for the mark "INTERFINA", Canc. No. 14,662.

Best Foot Forward, Inc., Chicago, Ill., Reg. No. 1,145,316, for the mark "BEST FOOT FORWARD", Canc. No. 14,989.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Notice for Registered Patent Attorneys and Agents

The United States Patent and Trademark Office (PTO) has been informed of a COMPLAINT filed in, and an ORDER FOR JUDGMENT and JUDGMENT entered in the Circuit Court, La Crosse County, State of Wisconsin in *State of Wisconsin* v. *Invention Marketing, Inc., et al.,* Case No. 84–CV–541.

In order to facilitate compliance with the provisions of 37 CFR 10.23(c)(17) by registered patent attorneys and agents who are representing before the PTO in a patent case either a joint venture comprising an inventor and Invention Marketing, Inc., or an inventor referred to the registered patent attorney or agent by Invention Marketing, Inc., the full text of the COMPLAINT (without referenced exhibits), ORDER FOR JUDGMENT, and JUDGMENT are reproduced below.

CAMERON WEIFFENBACH,
Director, Office of Enrollment & Discipline.

May 16, 1986.

State of Wisconsin
Circuit Court
La Crosse County

STATE OF WISCONSIN,
Plaintiff,

v.

COMPLAINT
Case No. 84-CV-541

INVENTION MARKETING, INC.,
a Pennsylvania corporation,
and MARTIN S. BERGER,
individually and as an
officer and agent of the
corporation,
Defendants

The State of Wisconsin, by its attorneys, acting on behalf of the Wisconsin Department of Justice, brings this action against the defendants herein and complains and alleges as follows:

Jurisdiction

1. This claim for relief is filed pursuant to section 100.18(11)(d), Stats., to prevent and restrain violations of sec. 100.18(1), Stats., and to obtain restoration of pecuniary losses suffered by Wisconsin citizens as a result thereof, and pursuant to sec. 100.26(4), Stats., to recover civil forfeitures for violations of sec. 1001.18(1), Stats.

The Defendants

2. Defendant Invention Marketing, Inc., is a Pennsylvania corporation, and is located at the Triangle Bldg., 701 Smithfield St., Pittsburgh, Pa. 15222.

3. Defendant Martin S. Berger, an adult male, is the president and owner of Invention Marketing, Inc.; in such capacity, he has taken part in the formulation, direction and control of the acts and practices of said business operation.

4. Whenever in this complaint reference is made to any action of either of the defendants, or to any action of any one of the agents, employees, salesmen, or representatives of either of the defendants, such allegation shall be deemed to mean that such action was taken with the knowledge and consent of each of the defendants and was taken pursuant to a common scheme or plan.

5. Plaintiff is informed and believes that other individuals, companies or corporations have participated or are participating in the illegal practices or activities complained of herein. Such persons, companies or corporations may be joined in this action when their identity and the degree of their participation in the practices and activities have been ascertained.

Nature of Defendants' Business

6. The defendants have been engaged in an operation throughout the United States, including the State of Wisconsin, and the county of La Crosse, whereby customers are solicited to submit inventions to defendants, along with a prepaid fee, for the purpose of having defendants conduct a marketing feasibility study and development and execution of a marketing program.

7. Beginning at an exact date unknown, but at least since Oct. of 1979, defendants have operated their solicitation by initial contact through radio and magazine advertisements reaching citizens throughout the State of Wisconsin.

8. When a potential customer responds to some form of defendants' advertisements, that individual receives an informational packet describing defendants' operation and services. Examples are attached hereto as Exhibits A, B and C. The potential customer is requested to provide defendants with a description of his or her invention. Once this is done, telephone contact is made by representatives of defendants, who solicit potential customers to send defendants a fee for prepayment of an initial marketing analysis. A sample copy of the Evaluation Request agreement is attached hereto, and incorporated herein, as Exhibit D. This prepaid initial fee for Wisconsin consumers has ranged from $200.00 to at least $550.00

9. Thereafter, the consumer is provided with a marketing analysis of his or her invention and solicited to prepay an additional fee to defendants for the purpose of having defendants carry through with a marketing program for the consumer's invention. Defendants and the consumer enter into a Representation Agreement, an example of which is attached hereto, and incorporated herein, as Exhibit E. This prepaid fee for Wisconsin consumers has ranged from $1,350.00 to at least $5,295.00.

Misrepresentations Alleged

10. In the course of soliciting Wisconsin residents to purchase their services, the defendants, through written representations in their sales literature, and oral representations made by agents and representatives, have made untrue, deceptive and misleading representations and statements which are in violation of sec. 100.18(1), Stats., and are enjoinable pursuant to sec. 100.18(11)(d), Stats., such as the following:

a. That each idea submitted to them is innovative and marketable; in truth and in fact, most of the ideas submitted to them have already been patented or marketed or are not marketable.

b. That clients will realize large financial gains from marketing their inventions through defendants; in truth and in fact, few if any clients realize any financial gain from their association with defendants, but rather are financially injured at least to the extent of their investments with defendants.

c. That defendants have successfully marketed many new ideas when, in truth and in fact, few if any new ideas have been successfully marketed by defendants.

d. That defendants have successfully marketed the products pictured in their multicolored advertising literature, when in truth and in fact, defendants were involved in marketing few, if any, of the items pictured.

e. That the fee for the marketing analysis would be the only fee involved in the program or that the second fee, for the marketing program, is nothing to worry about; in truth and in fact, whereas the initial fees have ranged from $200.00 to at least $550.00, the second fee, about which the consumer is often not informed until after investing the initial fee, has ranged from $1,350.00 to at least $5,295.00.

f. That the invention of each and every potential client is feasible to produce for marketing; in truth and in fact, defendants' production feasibility studies, if performed at all, are totally inadequate to provide the client with factual information.

g. That the invention of a potential client has been presented to the defendant company's board of directors whose reaction is so positive that the members thereof have expressed an eagerness to invest a large amount of the company's own money in marketing the potential client's invention, once he or she has entered into a contract with defendants. In truth and in fact, little, if any, of defendants' own money or company assets are ever utilized.

h. That fees for certain clients are reduced because their idea is so exciting and potentially marketable; in truth and in fact, fees are reduced in proporton to the difficulty of soliciting a potential client to enter into a contract with defendants.

i. That defendants will provide a wide range of marketing services to clients; in truth and in fact, the written contract obligates them to do nothing more than make an initial contact with industry, prepare a product submission brochure and register a new idea or inven-

tion with the United States Patent Office. All other services, as listed in advertising brochures or offered orally in sales pitches, are discretionary.

j. That defendants maintain a close working relationship with their clients; in truth and in fact, once the consumer has paid his full fee and entered into the marketing contract with defendants, calls from clients are often no longer accepted and written inquiries receive a form letter response.

k. That defendants will work with clients in developing and improving their ideas; in truth and in fact, once clients have paid their second fee, defendants are unresponsive to clients' suggestions for improvements of their invention.

l. That defendants will pay for patent protection when in truth and in fact, the registration with the United States Patent Office does not patent an invention and provides no patent protection.

Demand for Relief

WHEREFORE, the State of Wisconsin demands judgment against the defendants as follows:

1. That defendants, their successors, assignees and transferees, their agents, employees, representatives and all persons acting or claiming to be acting on their behalf, be perpetually enjoined and restrained, pursuant to sec. 100.18(11)(d), Stats., from conducting business operations in Wisconsin in violation of sec. 100.18(1), Stats., in the manner alleged herein.

2. That pursuant to sec. 100.18(11)(d), Stats., the court order the defendants to restore any pecuniary loss suffered by any person because of the defendants' acts and practices, involved in this action, in violation of sec. 100.18(1), Stats.

3. That the court order a civil forfeiture to the State of Wisconsin in the amount of not less than $50.00 nor more than $200.00 against each of the defendants for each adjudged violation of sec. 100.18(1), Stats., by each of said defendants, pursuant to sec. 100.26(4), Stats., together with a penalty assessment of twelve percent (12%), pursuant to sec. 165.87, Stats., for each such violation.

4. For such other and further relief as the court deems just and equitable.

5. For the costs and disbursements of this action.

BRONSON C. LA FOLLETTE,
Attorney General

STEPHEN J. NICKS,
Assistant Attorney General

s/PAMELA MAGEE-HEILPRIN,
Assistant Attorney General

Attorneys for Plaintiff,
STATE OF WISCONSIN

State of Wisconsin
Circuit Court
La Crosse County

STATE OF WISCONSIN,
Plaintiff,

v. ORDER FOR JUDGMENT
Case No. 84–CV–541

INVENTION MARKETING, INC.,
a Pennsylvania corporation,
Defendant.

Upon the written stipulation of the parties, IT IS ORDERED:

1. That the defendant, Invention Marketing, Inc., is permanently enjoined from engaging in the practices set forth in the judgment attached hereto.

2. That the defendant, Invention Marketing, Inc., shall pay to the Wisconsin Department of Justice for restoration of pecuniary losses the sum of $30,000.00 according to the terms of the judgment attached hereto.

3. That no costs are awarded to either party.

IT IS SO ORDERED.

BY THE COURT:

s/DENNIS G. MONTABON,
Sept. 27, 1985. *Circuit Court Judge*

State of Wisconsin
Circuit Court
La Crosse County

STATE OF WISCONSIN,
Plaintiff,

v. JUDGMENT
Case No. 84–CV–541

INVENTION MARKETING, INC.,
a Pennsylvania corporation,
Defendant.

Upon the written stipulation of the parties, IT IS ORDERED, ADJUDGED AND DECREED, as follows:

1. That the written stipulation of the parties is approved and incorporated herein by reference.

2. That the defendant Invention Marketing, Inc., its successors, assignees, transferees, agents, officers and employees, and all persons acting on its behalf, pursuant to sec. 100.18(11)(d), Stats., are hereby enjoined within the State of Wisconsin from engaging in the practices described below, as follows:

a. Defendant shall not fail to disclose, prior to the time that a potential client has paid money to defendant, the total amount of fees that may or will be charged, as well as the services that will be provided for each fee charged.

b. Defendant shall not represent that it will obtain a patent for potential or existing clients, unless such is true in actual fact.

c. Defendant shall not represent to potential clients that their invention will be successful, or will sell for profit, or that defendant will invest its own funds in the marketing of the client's product, unless such is true in actual fact.

d. Defendant shall not fail to provide plaintiff with a list of Wisconsin clients who contract with defendant. Said list shall be provided on a monthly basis beginning 30 days from the date of this judgment and shall be provided every 30 days thereafter for one year from the date of this judgment.

3. That pursuant to sec. 100.18(11)(d), Stats., the defendant shall pay to the Wisconsin Department of Justice for restoration of pecuniary losses the amount of $30,000.00. Said payments shall be made in three installments, with $10,000.00 to be paid at the time this judgment is entered, $10,000.00 to be paid 90 days after this judgment is entered and $10,000.00 to be paid 180 days after the date this judgment is entered. Said payments shall be fully disbursed by the Wisconsin Department of Justice to defendant's Wisconsin clients.

4. That neither the stipulation nor the names of the State of Wisconsin Department of Justice or their employees or subdivisions shall be used by the defendant or its representatives in connection with the sale or solicitation for sale of its services in the State of Wisconsin or elsewhere.

LET JUDGMENT BE SO ENTERED.

s/JACK FROST,
Sept. 27, 1985. *Clerk of Court.*

PATENT NOTICES

Certificates of Correction for the Week of June 10, 1986

D. 278,262	4,528,790	4,552,929	4,570,553
D. 282,663	4,529,348	4,553,199	4,570,758
3,793,288	4,530,882	4,553,256	4,570,894
4,163,250	4,531,138	4,555,350	4,571,093
4,330,462	4,531,490	4,556,098	4,571,289
4,348,783	4,531,588	4,557,569	4,571,456
4,359,420	4,532,043	4,558,046	4,571,517
4,382,279	4,533,550	4,560,674	4,571,537
4,430,890	4,535,048	4,560,777	4,571,687
4,463,658	4,535,114	4,561,060	4,571,856
4,466,493	4,535,907	4,562,136	4,571,970
4,471,877	4,537,768	4,562,551	4,572,684
4,472,873	4,539,169	4,564,249	4,572,977
4,478,807	4,539,805	4,564,497	4,573,521
4,489,217	4,541,989	4,565,032	4,573,837
4,490,975	4,542,866	4,565,082	4,574,103
4,493,600	4,543,134	4,565,687	4,574,804
4,497,379	4,544,467	4,565,853	4,574,844
4,499,069	4,546,788	4,565,898	4,574,982
4,499,251	4,546,980	4,566,439	4,575,038
4,505,458	4,547,302	4,566,746	4,575,597
4,508,148	4,547,470	4,567,096	4,575,666
4,515,125	4,547,685	4,567,181	4,575,812
4,516,806	4,548,859	4,568,147	4,576,343
4,516,946	4,549,206	4,568,283	4,576,450
4,519,758	4,549,382	4,568,430	4,576,481
4,520,223	4,550,726	4,568,618	4,576,965
4,521,068	4,551,138	4,569,037	4,576,968
4,525,058	4,551,420	4,569,183	4,578,742
4,525,232	4,551,438	4,569,868	4,579,249
4,525,508	4,552,595	4,569,902	4,579,919
4,525,613	4,552,646	4,570,525	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2432
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
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Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
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Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 1, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	7-23-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-18-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-17-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	2-01-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-26-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-18-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-25-84
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-01-85

Expiration of patents: The patents within the range of numbers indicated below expire during May 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

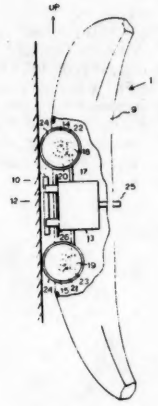
Patents ..... Numbers 3,441,960 to 3,447,159, inclusive
Plant Patents ..... Numbers 2,882 to 2,889 inclusive

REEXAMINATIONS

JUNE 10, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,810,515 (513th)
WALL CLIMBING DEVICES
Ben Ingro, 2437 N. 73rd Ave., Elmwood Park, Ill. 60635
Reexamination Request No. 90/000,717, Jan. 25, 1985.
Reexamination Certificate for Patent No. 3,810,515, issued May 14, 1974, Ser. No. 296,112, Oct. 10, 1972.
Int. Cl.[4] B62D *63/02*
U.S. Cl. 180—54.2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **2** are now disclaimed.

Claim **3** is cancelled.

Claims **4–6** are determined to be patentable as amended.

Claim **7**, dependent on an amended claim, is determined to be patentable.

New claims **8–15** are added and determined to be patentable.

13. In a device adapted to move along a planar vertical surface of a member of magnetic material,

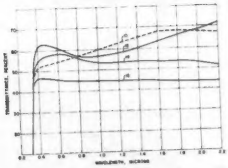
a. a frame structure,

b. a pair of wheel means journaled on said frame structure on spaced parallel axes for engagement of peripheral portions thereof with spaced portions of a planar surface,

c. each of said wheel means including peripheral coating means of a soft rubber material for increased traction, and

d. permanent magnet means carried by said frame structure in a manner such as to be spaced a certain spacing distance from a planar surface engaged by said wheel means, said certain spacing distance being large enough to avoid frictional engagement between said permanent magnet means and a planar surface engaged by said peripheral portions of said wheel means and being small enough to provide magnetic attraction to a member of magnetic material sufficient to maintain engagement between said peripheral portions of said wheel means and a planar vertical surface of a member of magnetic material.

B1 3,826,728 (514th)
TRANSPARENT ARTICLE HAVING REDUCED SOLAR RADIATION TRANSMITTANCE AND METHOD OF MAKING THE SAME
Douglas L. Chambers; Donald C. Carmichael, and Chong T. Wan, all of Columbus, Ohio, assignors to Shatterproof Glass Corpration, Detroit, Mich.
Reexamination Request No. 90/000,529, Mar. 19, 1984.
Reexamination Certificate for Patent No. 3,826,728, issued Jul. 30, 1974, Ser. No. 253,278, May 15, 1972.
Contination of Ser. No. 38,962, May 20, 1970, abandoned.
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192 P



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** and **2** is confirmed.

New claims **3–16** are added and determined to be patentable.

1. A transparent article having reduced solar radiation transmittance and reduced glare, which comprises:

(a) a transparent glass sheet for use as a window pane and the like having a smooth continuous surface; and

(b) a continous sputter-coated film on said continuous glass sheet to a thickness of from 200 to 400 A. a A., said film being a metal selected from the group consisting of nickel and nickel-base alloys;

(c) said coated glass sheet having a substantially uniform transmittance over the range of 0.75 to 2.0 microns at a level relatively lower than the level of transmittance in the visible range and the transmittance also being substantially uniform in the visible range of 0.4 to 0.75 microns resulting in excellent color fidelity and natural visibility therethrough substantially free from distortion.

B1 4,132,605 (515th)
METHOD FOR EVALUATING THE QUALITY OF ELECTROPLATING BATHS
Dennis M. Tench, and Cameron A. Ogden, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Reexamination Request No. 90/000,670, Nov. 23, 1984.
Reexamination Certificate for Patent No. 4,132,605, issued Jan. 2, 1979, Ser. No. 754,476, Dec. 27, 1976.
Filed Nov. 23, 1984, Ser. No. 754,476
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—1 T

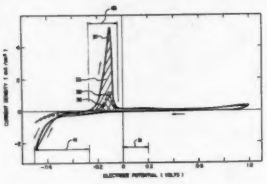
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–9 are cancelled.

New claims 10 and 11 are added and determined to be patentable.

11. A method of determining if a bath for electroplating a metal has an acceptable, effective quantity of organic leveling agent, comprising the steps of:

a. sweeping a working electrode through at least one voltammetric cycle comprising a sweeping of voltage toward one polarity followed by a sweeping of voltage toward a reverse of said one polarity to complete a cycle, said voltammetric cycle including a metal plating range and a metal stripping range, for a bath having a minimum acceptable effective quantity of organic leveling agent, said sweeping being done both while



there is no relative motion and while there is relative motion between said bath and said working electrode;

b. measuring the coulombs utilized during said metal stripping range of said cycle for said bath having a minimum acceptable effective quanity of organic leveling agent, and obtaining the ratio of coulombs utilized with relative motion divided by the coulombs utilized with no relative motion;

c. repeating steps (a) and (b) for a bath having a maximum acceptable effective quantity of organic leveling agent;

d. repeating steps (a) and (b) for a bath having a unknown quantity of organic leveling agent, whereby said bath of unknown quantity of organic leveling agent has an acceptable, effective quantity of organic leveling agent when the ratio obtained during step (d) is within the range established by steps (b) and (c).

B1 4,189,079 (516th)

CONTROLLABLE DRIVE FOR TAPE RECORDER

Zenshiro Uehara, Tokyo, Japan, assignor to Hashimoto Corp., Tokyo, Japan

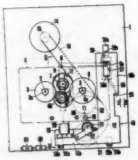
Reexamination Request No. 90/000,661, Nov. 5, 1984.

Reexamination Certificate for Patent No. 4,189,079, issued Feb. 19, 1980, Ser. No. 913,513, Jun. 7, 1978.

Claims priority, application Japan, Oct. 31, 1977, 52-129641

Int. Cl.[4] B65H *17/22*

U.S. Cl. 226—188



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–4 are cancelled.

[1. A controllable drive for tape recorder comprising a capstan rotatably mounted on a chassis, a flywheel mounted on and in concentric relationship with the capstan, a gear integrally connected with the flywheel in concentric relationship therewith, a toothed wheel with hiatus which is rotatably mounted on the chassis and disposed for meshing engagement with the gear, a cam integral with the hiatus wheel, a link disposed for angular movement on the chassis to be angularly driven by the cam for producing a force which is necessary to operate the tape recorder, a movable element mounted on the chassis so as to be engageable and disengageable from the hiatus wheel and operative to lock the hiatus wheel when a hiatus thereof is located in opposing relationship with the gear, and means for operating the movable element.]

B1 4,293,140 (517th)

AUTOMOBILE SPLASH GUARD AND ATTACHMENT MEANS THEREFOR

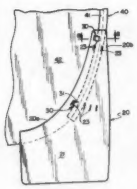
Ted A. Bell, Coshocton, and Daniel F. Lehner, Lafayette, both of Ohio, assignors to Pretty Products, Inc., Coshocton, Ohio

Reexamination Request No. 90/000,493, Jan. 25, 1984.

Reexamination Certificate for Patent No. 4,293,140, issued Oct. 6, 1981, Ser. No. 966,505, Dec. 4, 1978.

Int. Cl.[4] B62D *25/16*

U.S. Cl. 280—154.5 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–22 is confirmed.

1. A splash guard assembly for an automotive vehicle having a thin, sheet-form mounting plate extending in a generally vertically oriented direction at a wheel opening thereof comprising

a sheet-form guard member adapted to be supported on said mounting plate and having an elongated marginal edge portion of a configuration to be co-extensive with said mounting plate, said guard member provided with at least two sockets formed in the marginal edge portion and disposed in relatively vertically spaced relationship along the marginal edge portion and a predetermined distance relatively inward of a peripheral edge thereof, and

fastening means for securing said guard member to the vehicle mounting plate including a fastening clip secured in each of said sockets, each of said clips being fabricated from an elongated, flat strip of resilient material folded into a predetermined shaped configuration having first and second legs defining respective independent clamping elements, said fastening clips each including an interconnecting bar with said first and second legs connected to opposite ends thereof and extending in superposed relationship thereto to receive the guard member and mounting plate between respective ones of said first and second legs and said interconnecting bar, said first leg adapted to project through a selected one of said sockets to frictionally engage with said guard member in clamped relationship and said second leg adapted to mechanically couple with the vehicle mounting plate in clamped relationship.

22. A splash guard assembly for an automotive vehicle hav-

ing a thin, sheet-form mounting plate extending in a generally vertically oriented direction at a wheel opening thereof comprising

a sheet-form guard member adapted to be supported on said mounting plate and having an elongated marginal edge portion of a configuration to be coextensive with at least a portion of said mounting plate, said guard member provided with at least two sockets formed in the marginal edge portion and disposed in relatively vertically spaced relationship along the marginal edge portion and a predetermined distance relatively inward of a peripheral edge thereof, and

fastening means for securing said guard member to said mounting plate including a fastening clip secured in each of said sockets, each of said clips having first and second legs and an elongated interconnecting bar carrying said first and second legs, said interconnecting bar and said first leg formed from an elongated, flat strip of resilient material folded into a U-shaped configuration, thereby defining a clamping element adapted to receive a sheet-form mounting plate in edgewise clamped relationship therebetween and to mechanically interengage therewith, said first leg secured to and resiliently biased toward said interconnecting bar and extending in superposed, substantially coplanar relationship thereto at one side thereof, said second leg carried by said interconnecting bar at a side thereof opposite to said first leg and adapted to project through a selected one of said sockets, said second leg including a clamping surface extending in superposed relationship to said interconnecting bar to mechanically engage with said guard member and clamp said guard member in secured relationship to said interconnecting bar and to thereby secure said guard member with said mounting plate in supported relationship.

B1 4,381,379 (518th)

POLYESTER CONTAINING 2-METHYL-1,3-PROPYLENE TEREPHTHALATE UNITS

Yuzo Toga; Toshio Shimada, and Hajime Komada, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Reexamination Request No. 90/000,790, May 28, 1985.
Reexamination Certificate for Patent No. 4,381,379, issued Apr. 26, 1983, Ser. No. 360,493, Mar. 22, 1982.
Claims priority, application Japan, Mar. 25, 1981, 56-44286; Apr. 15, 1981, 56-56766
Int. Cl.[4] C08F *283/02;* **C08G** *63/76*
U.S. Cl. 525—444

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

Claim **7** is determined to be patentable as amended.

Claims **8** and **9**, dependent on an amended claim, are determined to be patentable.

7. A polyester resin composition which comprises a blend of a first resin which consists essentially of polytetramethylene terephthalate and a second resin which consists essentially of a member selected from the group consisting of (a) **[**poly-2-methyl-1,3-propylene terephthalate resin, (b)**]** a copolyester obtained by copolymerizing terephthalic acid with 2-methyl-1,3-propanediol and tetramethylene glycol, and **[**(c)**]** *(b)* mixtures of (a) **[**and (b)**]**, *and poly-2-methyl-1,3-propylene terephthalate resin,* said blend containing from 0.1 to 25 percent by weight, of 2-methyl-1,3-propylene terephthalate units.

REISSUES

JUNE 10, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,173

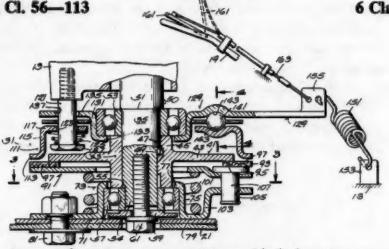
LAWN MOWER BRAKE AND CLUTCH DEVICE

Ronald B. Lloyd, Gilson, and Gerald H. Wick, Galesburg, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Original No. 4,352,266, dated Oct. 5, 1982, Ser. No. 247,403, Mar. 25, 1981. Application for reissue Nov. 23, 1983, Ser. No. 554,524

Int. Cl.[4] A01D *69/10*

U.S. Cl. 56—113 **6 Claims**



3. A rotary lawn mower comprising a blade housing supported for travel over the ground, a prime mover mounted on said blade housing, a cutter blade, and a combined clutch and brake located between said prime mover and said cutter blade and comprising a drive assembly including a drive shaft driven by said prime mover for rotation about an axis, and a driving disk fixedly extending on said drive shaft for common rotation therewith and against axial movement therebetween, a driven member connected to said cutter blade, means mounting said driven member from said drive shaft for relative rotation therebetween and against axial movement therebetween, a ring member located in encircling relation to said drive shaft between said disk and said driven member and including a friction surface having a radially inner portion in facing relation to said disk and a radially outer portion having an outer periphery, means biasing said ring member axially towards said disk for driving engagement by said disk with said inner portion of said friction surface, brake means fixed against rotary movement and movable axially between a retracted position and a braking position engaged with said outer portion of said friction surface so as to disengage said ring member from said disk against the action of said biasing means and so as to prevent rotation of said ring member, one or more studs extending from one of said members in parallel relation to the rotary axis in the direction away from said disk, and in radially outward relation from said biasing means and in radial inward relation from said outer periphery of said ring member, and a corresponding one or more apertures in the other of said members receiving said studs to afford common rotary movement therewith and relative axial movement therebetween.

Re. 32,174

COMBINATION OF HYDROXY AMINES AND CARBOXYLIC DISPERSANTS AS FUEL ADDITIVES

William M. LeSuer, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

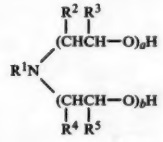
Original No. 4,409,000, dated Oct. 11, 1983, Ser. No. 330,549, Dec. 14, 1981. Application for reissue Oct. 25, 1984, Ser. No. 664,648

Int. Cl.[4] C10L *1/18*

U.S. Cl. 44—70 **17 Claims**

1. A composition comprising:

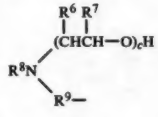
(A) at least one hydroxy amine of the formula



(I)

wherein:

R^1 is an alkyl or alkenyl radical containing from about 8 to about 30 carbon atoms or a radical of the formula



(II)

each of R^2, R^3, R^4, R^5, R^6 and R^7 is hydrogen or a lower alkyl radical;

R^8 is an alkyl or alkenyl radical containing from about 8 to about 30 carbon atoms;

R^9 is an alkylene radical containing from 2 to about 6 carbon atoms; and

each of a, b and c is an integer from 1 to about 75; and

(B) at least one hydrocarbon-soluble carboxylic dispersant characterized by the presence within its molecular structure of:

a substantially saturated hydrocarbon-based radical containing at least about 30 aliphatic carbon atoms, attached to

at least one acyl, acyloxy or acylimidoyl radical, which is also attached [through nitrogen to a polar group] *to a radical of the structure $-N<$ wherein the remaining valences of nitrogen are satisfied by forming a ring structure with a second acyl group of said carboxylic dispersant, hydrogen amino or organo radicals bonded to the said nitrogen atom through direct carbon-to-carbon linkages.*

Re. 32,175

(PNEUMATIC) HYDRAULIC CONTROL SYSTEM FOR AN AUTOMATIC VEHICLE TRANSMISSION

Ferdinand Piech, Ingoltadt; Heinz Dörpmund, Wolfsburg; Gerd Oberpilcher, Braunschweig; Ernst-August Honig, and Dieter Schmidt, both of Wolfsburg, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Original No. 4,331,045, dated May 25, 1982, Ser. No. 61,058, Jul. 26, 1979. Application for reissue Sep. 30, 1983, Ser. No. 537,644

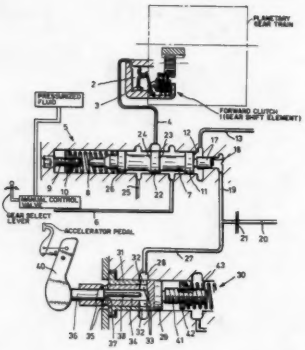
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1978, 2833641

Int. Cl.[4] B60K *41/22*; E16D *43/22*; B60K *41/06*

U.S. Cl. 74—867 **10 Claims**

1. In an automatic transmission for a motor vehicle, having an accelerator pedal, said transmission having a mechanical planetary gear train with hydraulically actuatable gear shift elements, a gear select lever having a plurality of selectable forward drive positions, including automatic forward drive (D), a source of first pressurized hydraulic fluid, a manual control valve, responsive to the position of said select lever, for supplying said first fluid to a selected gear shift element when said lever is in one of said forward drive positions, and a fluid

line communicating between said manual control valve and said selected element for delivering said first fluid from said manual control valve to said selected element, a control system for selectively interrupting the supply of said first fluid to said selected element, comprising a main control valve arranged in said fluid line between said manual control valve and said selected element for controlling the supply of said first fluid



from said manual control valve to said selected element, said main control valve being responsive to the position of said accelerator pedal and controlling the supply of said first fluid to said element to discontinue said first fluid supply and exhaust the fluid from said element to disengage said element in selected vehicle operating conditions, said conditions including when said vehicle is stationary, said gear select lever is in automatic drive (D), and said accelerator pedal is released.

Re. 32,176

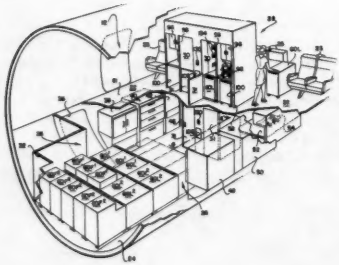
UNITIZED AIRCRAFT FOOD AND BEVERAGE SERVICE

Richard L. Vernon, 16775 Alondra Dr., Rancho Bernardo, Calif. 92128

Original No. 3,517,899, dated Jun. 30, 1970, Ser. No. 718,691, Apr. 4, 1968. Application for reissue Sep. 6, 1984, Ser. No. 648,184

Int. Cl.[4] B64D *11/04*

U.S. Cl. 244—118.5 **12 Claims**



12. In an aircraft an improved food and beverage service system comprising:

an aircraft having a fuselage, said fuselage being divided into an upper deck and a lower deck,

a kitchen disposed in said lower deck and located below the floor of said upper deck and between the side walls of said fuselage, said kitchen comprising food preparation and storage areas *including oven and cold storage means* and having a separate entrance below said upper deck for loading and unloading said kitchen,

a service module located above said kitchen on said upper deck, said service module dividing said aircraft into separate passenger areas,

elevator means disposed within said service module for connecting said kitchen and said service module whereby *prepared food* items *in individual serving portions* from said kitchen in said lower deck are prepositioned on said upper deck within said service module by said elevator means *and for providing a passage through which personnel may move between decks,*

[[*ladder means disposed between said upper deck and said lower deck for emergency egress,***]]** *and*

a plurality of wheeled serving units normally sequentially positioned in said kitchen, said serving units adapted to contain *said food* items to be served to passengers in said upper deck of said aircraft,

said serving units adapted to be transported from said kitchen to said service module and be circulated among the passengers in said upper deck of said aircraft to permit items contained therein to be dispersed to the passengers.

Re. 32,177

SINGLE LENS REFLEX CAMERA

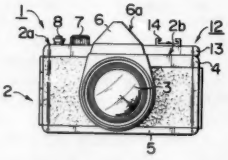
Akihiko Hashimoto, Tokyo; Tamotsu Koiwai, Nagano, and Toyohiko Kimura, Tokyo, all of Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan

Original No. 4,306,791, dated Dec. 22, 1981, Ser. No. 94,473, Nov. 15, 1979. Application for reissue Nov. 1, 1982, Ser. No. 438,003

Claims priority, application Japan, Feb. 8, 1979, 54/13866

Int. Cl.[4] G03B *15/05*

U.S. Cl. 354—126 **17 Claims**



11. A single lens reflex camera internally housing a drive motor which is used to wind or rewind the film comprising a transmission connected to said drive motor for transmitting the rotation of the motor to a film winding assembly and film rewind assembly, said drive motor and said transmission being disposed within the body of said camera, the top surface of the camera body having a pentaprism housing which is disposed substantially in its central region to project therefrom, said pentaprism housing having a pair of sides substantially symmetrically bevelled, said top surface of the camera body having a first surface on one side of the pentaprism housing and a second surface on the other side of said pentaprism housing, said first surface being formed at a lower elevation on said camera body than the elevation of said second surface to define a planar area in which a bore is formed, an accessory shoe member which comprises a platform having a height which corresponds to a difference in elevation between the planar area and the second surface of the camera located on the opposite side of the pentaprism housing and shaped to cover the planar area, said accessory shoe member including a mounting element to be received in said bore for mounting said accessory shoe member on said planar area, and a hot shoe centrally mounted on the upper surface of the platform for receiving a light emitting component.

Re. 32,178

PROCESS FOR PRODUCING COMPOUND BASED SUPERCONDUCTOR WIRE

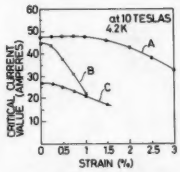
Kiyoshi Yoshizaki, Sagamihara, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Original No. 4,363,675, dated Dec. 14, 1982, Ser. No. 264,325, May 18, 1981. Application for reissue Feb. 7, 1984, Ser. No. 577,906

Claims priority, application Japan, May 19, 1980, 55-66166

Int. Cl.[4] H01L *39/24*

U.S. Cl. 148—11.5 P **8 Claims**



1. A process for producing a Nb_3Sn or V_3Ga compound-based superconductor wire comprising the steps of: forming a composition by blending at least one metal powder selected from the group consisting of Nb-based and V-based particles at least part of the surface of which is covered with at least one layer selected from the group consisting of [Cu-Sn-based], *in the case of Nb_3Sn compound-based superconductor wire, Cu-based and Sn-based, and in the case of V_3Ga compound-based superconductor wire, Cu-based* and Ga-based, metal layers with at least one metal powder or alloy powder selected from the group consisting of Cu-based, Sn-based, Ga-based, Cu-Sn based and Cu-Ga-based *particles*; reducing the cross-sectional area of said composition; heat treating said composition; and drawing the heat-treated composition into a wire.

Re. 32,179

POST-MIX BEVERAGE DISPENSING SYSTEM SYRUP PACKAGE, VALVING SYSTEM, AND CARBONATOR THEREFOR

Jason K. Sedam, Dunwoody, Ga., and William R. Fuerst, Tucson, Ariz., assignors to The Coca-Cola Company, Atlanta, Ga.

Original No. 4,359,432, dated Nov. 16, 1982, Ser. No. 257,945, Apr. 27, 1981. Division of Ser. No. 84,434, Oct. 12, 1979, Pat. No. 4,306,667. Application for reissue Nov. 16, 1984, Ser. No. 671,973

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—26 **2 Claims**

2. A carbonator system comprising:

a refillable water reservoir tank with a removable lid to permit manual refilling thereof;

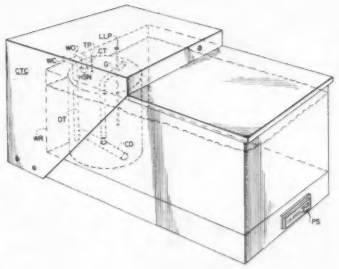
a carbonator tank operatively connected to said reservoir tank;

means for pumping water from said reservoir tank into said carbonator tank;

first liquid level detector means disposed in said reservoir tank for sensing when the water level therein falls below a predetermined minimum level;

second liquid level detector means disposed in said carbonator tank for sensing when said water level therein falls below a predetermined minimum level; and

control means responsive to both said first and second liquid level detector means for enabling said means for pumping when said water level in said carbonator tank falls below said predetermined level and disabling said means for pumping



when said water level in said reservoir tank falls below said predetermined level.

Re. 32,180

COMPOSITE SHEETS CONSTITUTING ELECTROMECHANICAL TRANSDUCERS AND TRANSDUCERS EQUIPPED WITH SUCH SHEETS

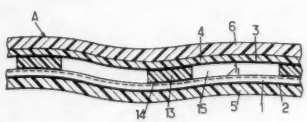
Jacques Lewiner, 5 rue Bory d'Arnex, 92210 Saint Cloud, and Claude Hennion, 18, rue Flatters, 75005 Paris, both of France

Original No. 4,359,726, dated Nov. 16, 1982, Ser. No. 228,716, Jan. 27, 1981. Application for reissue Nov. 15, 1984, Ser. No. 672,139

Claims priority, application France, Feb. 12, 1980, 8003093

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—573 **28 Claims**



13. An Apnea monitor comprising:

a composite sheet of sufficient area to underlie a baby comprising:

a piezoelectric foil;

electrodes covering opposite surfaces of said piezoelectric foil;

cover layers overlying each of said electrodes; and

spacing means, located between one of said cover layers and the corresponding electrode and affixed to said one cover layer and said corresponding electrode at a plurality of locations, for providing a plurality of compartments between said one cover layer and said corresponding electrode such that portions of the piezoelectric foil which lie adjacent these compartments will be reversibly lengthened when a pressure force is applied to the composite sheet at the corresponding compartments, said compartments being distributed substantially uniformly over the area of said piezoelectric foil; and

a monitor means, connected to said electrodes, for monitoring electrical signals produced in response to changes in the piezoelectric foil, whereby rhythmic movements of a baby will rhythmically lengthen and relax said portions of said piezoelectric foil so as to produce an electrical signal in response to said rhythmic movements which is monitored by said monitor means.

PATENTS

GRANTED JUN. 10, 1986

ERRATA

For CLASS	See PATENT NO.
181–144	4,593,784
384–001	4,593,956
384–049	4,593,957
522–099	4,594,134
530–332	4,594,187
530–332	4,594,188
558–412	4,594,195
558–255	4,594,197
558–351	4,594,198
514–012	4,594,329
523–122	4,594,365
544–180	4,594,413
352–050	4,594,733

PATENTS

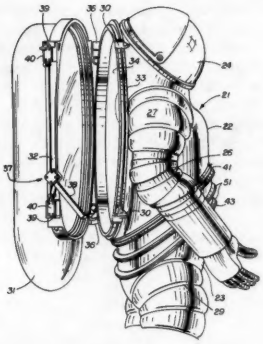
GRANTED JUNE 10, 1986

GENERAL AND MECHANICAL

4,593,415
TORSO SIZING RING CONSTRUCTION FOR HARD SPACE SUIT

Hubert C. Vykukal, Los Altos, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 20, 1984, Ser. No. 684,193
Int. Cl.[4] A62B *17/00*; F16L *11/18*
U.S. Cl. 2—2.1 A **10 Claims**



2. An apparatus for joining together the rigid upper and lower sections of the torso portion of a hard space suit and altering the length of said torso portion, said apparatus comprising,

a first coupler formed with a first collar, said coupler being adapted to be affixed to the lower edge of said upper torso section,

a second coupler having a second collar and a contiguous flange, said second coupler being adapted to be affixed to the upper edge of said lower torso section,

a sizing ring having a third collar and a contiguous shoulder formed on a first end of said sizing ring, said third collar being dimensioned to fit within said first collar,

means for detachably securing said first collar to said third collar, said securing means being substantially coextensive with the girth of said collars,

means for forming a hermetic seal between said first and third collars,

said shoulder stopping movement between said first and third collars,

said sizing ring having a fourth collar and a contiguous second shoulder formed on a second end, said fourth collar being dimensioned to fit around said second collar,

means for detachably securing said second collar to said fourth collar, said securing means being substantially coextensive with the girth of said collars,

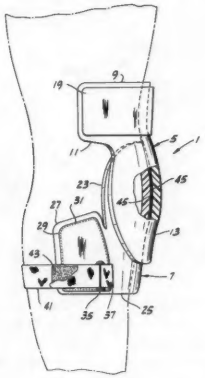
means for forming a hermetic seal between said second and fourth collars, and

said flange and said second shoulder stopping movement between said second and fourth collars.

4,593,416
KNEE PAD

Harry E. Figgie, III, Pepper Pike, and Matthew P. Figgie, Willoughby, both of Ohio, assignors to Figgie International Inc., Willoughby, Ohio

Continuation of Ser. No. 503,037, Jun. 10, 1983, Pat. No. 4,490,855. This application Dec. 7, 1984, Ser. No. 679,224
The portion of the term of this patent subsequent to Jan. 1, 2002, has been disclaimed.
Int. Cl.[4] A41D *13/06*
U.S. Cl. 2—24 **6 Claims**



1. A knee pad comprising:

a flexible upper pad of resilient material having upper and lower portions;

a flexible lower pad of resilient material having upper and lower portions;

means for holding the lower pad on the leg in a position wherein the lower portion of the pad is below the knee and the upper portion of the pad extends up at the front of the knee;

means for holding the upper pad on the leg in a position wherein the upper portion of the pad is above the knee and the lower portion of the pad overlaps the upper portion of the lower pad at the front of the knee to protect the knee; and

means for holding the overlapping portions of the upper and lower pads in generally close conformance with the knee when the knee is flexed, said pads being resiliently bendable when the knee is flexed to ensure said close conformance with the knee without substantially inhibiting flexing of the knee, said pads being sized and shaped for remaining in overlapping relation even when the knee is fully flexed thereby to provide maximum protection for the knee.

4,593,417
CONVERTIBLE SURVIVAL CAP

William C. Brown, Jr., and Margie E. Brown, both of Rte. 1, Box 110B, Jonesville, La. 71343

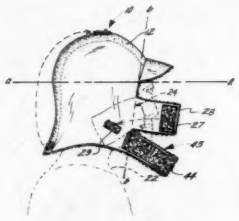
Filed Sep. 12, 1984, Ser. No. 649,685
Int. Cl.[4] A42B *1/06*
U.S. Cl. 2—209.1 **4 Claims**

1. A convertible survival cap providing selective full or partial coverage of the wearer's head, neck and face areas, comprising:

a. a crown portion which covers the head of the wearer generally above the wearer's ears and eyes;

b. a foldable skirt which extends downwardly from the crown portion to a position below the wearer's neck and circumferentially around the wearer's neck, terminating at left and right skirt edges which generally coincide with the peripheral sides of the wearer's face when the skirt is unfolded;

c. a first upper pair of independently closable flap covers attached to an extending respectively from the left and right edges of the skirt, the upper flap covers being connectable together in a first "forward" position for that covering the wearer's nose and mouth area, and the upper flap covers can be folded at the skirt edges to a second "rearward" position in which the upper flap covers abut and connect to the skirt to expose the wearer's nose and mouth;



d. a second lower pair of independently closable flap covers positioned below the upper flap covers, each lower flap cover being independently movable with respect to the first pair of upper flap covers but which are likewise attached to and extending respectively from the left and right skirt edges, the lower flap covers being connectable together in a forward position for covering the wearer's forward neck area;

e. upper flap connector means carried by the upper pair of flap covers for selectively affixing the upper pair of flap covers in a preselected forward and in a rearward position; and

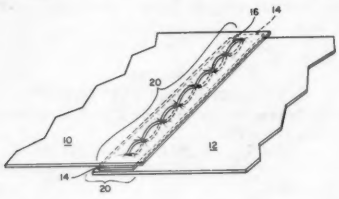
f. the skirt being foldable generally along a line where the skirt connects to the crown so that when the upper flaps are in the rearward position and the lower flaps are disconnected, the skirt, the rearwardly positioned upper flap covers, and the lower flap covers can be folded upon the crown to expose the wearer's neck, face and ears.

4,593,418

METHOD AND SEAM CONSTRUCTION TO SIGNIFICANTLY REDUCE SEAM LEAKAGE

Gene F. Simon, Marietta, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 29, 1984, Ser. No. 614,933
Int. Cl.[4] A41D *27/24*
U.S. Cl. 2—275 **9 Claims**



1. Improved self-sealing seam construction comprising,

(a) at least two layers of water-resistant materials, said layers being disposed in overlapping relationship along a seam area,

(b) a higly resilient, nontacky elastomeric tape having a quick release percent increase in length of less than 5%, an ultimate tensile strength in the range of from about 2,000 to 5,000 p.s.i., a permanent set less than about 40%, and an ultimate elongation in the range of from about 300% to 1000%, between said layers in the same area,

(c) said combination of layers and tape being sewn by thread passing through the combination in the seam area whereby said highly resilient elastomeric tape closes about said thread reducing the tendency of said combination to permit water to penetrate the seam area.

5. A method of forming a self-sealing seam comprising the step of,

(a) providing at least two layers of water-resistant materials,

(b) disposing said layers in overlapping relationship along a seam area,

(c) providing a highly resilient elastomeric tape having a quick release percent increase in length of less than 5%, and ultimate tensile strength of the range of from about 1,000 to 6,000 p.s.i., a modulus at 500% stretch in the range of from about 500 p.s.i. to 4,000 p.s.i., and an ultimate elongation in the range of from about 200% to 1,000%, between said layers in the seam area,

(d) penetrating said combination of layers and tape with a thread containing needle causing an aperture to be formed under stressed conditions passing said thread through the combination in the seam area,

(e) withdrawing said needle also under stressed conditions,

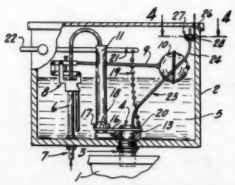
(f) whereby said elastomeric material closes tightly about the thread within said needle aperture sealing said combination to reduce the tendency to permit water to penetrate the seam area.

4,593,419

FLUSH VALVE CONTROL FOR WATER CLOSET

Gene A. Derus, 4784 W. Highway KK, R.R. 4, Appleton, Wis. 54911

Continuation of Ser. No. 385,107, Jun. 4, 1982, abandoned. This application Oct. 29, 1984, Ser. No. 666,257
Int. Cl.[4] E03D *1/14, 3/12*
U.S. Cl. 4—324 **10 Claims**



1. A flush valve control for use in a water closet flush tank having a transfer passageway from the lower end of the tank to a toilet bowl and including a flush valve unit having an air fillable flapper valve member having a bottom opening coupled to the transfer passageway within the tank and said valve member having a pivot mounting means secured to one side of the valve member to permit raising said valve member, an operator connected to said valve member for pivoting the valve member to an inclined position and exposing the bottom opening of the valve member to the water and trapping air within the valve member to maintain buoyancy thereof, an air release unit comprising a flexible tube having a smooth inner surface to provide a free air flow passageway and having an end secured to said valve member, said flexible tube being secured to the outer peripheral portion of the valve member opposite to said pivotal mount and thereby to locate the end of the tube in the highest region of the valve member in the open

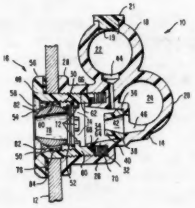
portion, said tube extending upwardly through the tank and having the upper end located above the water level in the tank, and a meter valve secured to the exterior of the tube and including a collar member encircling the tube and a pin threadedly secured in the collar and engaging the tube to collapse the tube between the pin and the collar and thereby control the cross-sectional area of the tube opening to thereby provide an adjustable air restriction in said passageway and control the rate of buoyancy loss of the flush valve unit.

4,593,420

SELF-DRAINING HYDROMASSAGE FITTING

Samuel Tobias, Edison, and Robert M. Messinger, Cranford, both of N.J., assignors to Hayward Industries, Inc., Elizabeth, N.J.

Filed Oct. 11, 1985, Ser. No. 786,809
Int. Cl.[4] A04H *3/18*; A61H *33/02*
U.S. Cl. 4—496 **14 Claims**



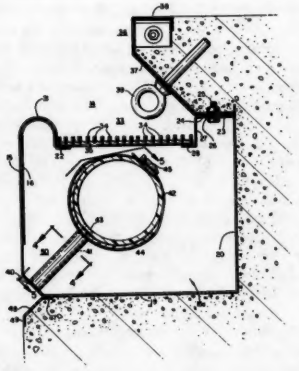
1. A hydromassage fitting, comprising an outlet, a mixing chamber in which water and air are mixed, directing means positioned downstream from said mixing chamber for adjustably directing an aerated jet of water out of said outlet and mounting means for adjustably mounting said directing means within said fitting, said mounting means including draining means for draining water from said mixing chamber around said directing means and out said outlet, whereby substantially all of the water in said mixing chamber can be drained from said fitting when said fitting is not in use.

4,593,421

TURBULENCE REDUCING GUTTER SYSTEM FOR SWIMMING POOLS

Ira M. Cohen, 412 Anthwyn Rd., Narberth, Pa. 19072

Filed Feb. 28, 1985, Ser. No. 706,494
Int. Cl.[4] E04H *3/20*
U.S. Cl. 4—507 **7 Claims**



1. An overflow recirculating gutter system for use around the perimeter of a swimming pool having vertical side walls and a deck, for skimming the surface water of the pool and returning clean water to the pool which comprises

a plurality of open box-like gutter sections secured together in end to end relation and carried in a perimeter groove between said side walls and said deck,

each section having a front wall facing the interior of said pool,

an inclined wall attached to said front wall having spaced openings therethrough, a bottom wall attached to said inclined wall, and a rear wall attached to said bottom wall,

skirt means fastened and extending along said pool side of said bottom wall, said skirt means including an inclined wall resulting in that water injected into the pool from injecting nipples is injected above the skirt and away from the vertical walls of the pool,

a converter in communication with said gutter sections to carry away skimmed water,

water supply means carried within said gutter sections for supplying clean water which includes

a header pipe and fittings extending around the perimeter of the pool,

a plurality of injection nipples in communication with said header pipe and engaged with said openings in said first mentioned inclined wall, and

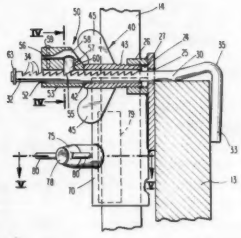
drag reducing means in said gutter and engaged with the exteriors of said injection nipples, said drag reducing means including side walls which extend on either side of said injection nipples.

4,593,422

TELESCOPING WING NUT CLAMPING UNIT

George H. Wolpert, Jr., Columbia, and Albert E. Sebest, Lancaster, both of Pa., assignors to Spectro Industries, Inc., Jenkintown, Pa.

Filed Jul. 29, 1983, Ser. No. 518,641
Int. Cl.[4] A47C *31/00*; A44B *21/00*
U.S. Cl. 5—503 **18 Claims**



1. A bed trapeze securing device comprising stabilizing means engaging a bedboard for providing a stable base for said device; mast holding means fixed to said stabilizing means for securing a mast for holding a trapeze; and a quick-release ratchet clamp means connected through said stabilizing means for securing said stabilizing means to said bedboard wherein said quick-release ratchet clamp means further includes at least one retainer shaft extending through said stabilizing means, said shaft having a ratchet end, an elbow and a clamp end, twisting means engaging said stabilizing means and with a central bore therethrough to allow passage of said retainer shaft for precise tightening of said ratchet clamp means, and quick-release means slidable on said ratchet end and for releasably grasping said ratchet end and providing a stop for said twisting means.

14. A clamping device comprising first and second retainer means for engaging an object to be clamped, said first retainer means having an orifice through which said second retainer means extends, wherein said first retainer means includes stabi-

lizing means engaging said object and forming a portion of said orifice, twisting means for adjustably engaging said stabilizing means and forming a portion of said orifice, and ratchet means for movably engaging and quickly releasing from engagement of said second retainer means whereby said clamping device may be quickly disengaged from said object by disengaging said ratchet means.

4,593,423

LASTING HEEL SEAT AND SIDE PORTIONS OF A SHOE

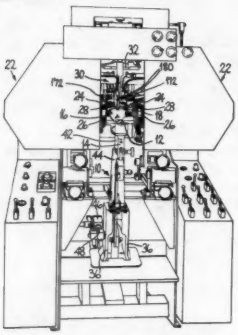
Andrew P. Clarkson, Quorn; James R. Flanders, Blaby, and Frank C. Price, Leicester, all of England, assignors to USM Corporation, Farmington, Conn.

Filed Oct. 25, 1982, Ser. No. 436,290

Claims priority, application United Kingdom, Oct. 29, 1981, 8132558

Int. Cl.[4] A43D *21/00*

U.S. Cl. 12—145 **19 Claims**



1. A method of lasting heel seat and side portions of a shoe comprising the steps of:

(i) placing a shoe, comprising a shoe upper on a last with an insole on the last bottom, on a support and locating it both lengthwise and heightwise in a predetermined relationship with a heel seat wiper assembly by engagement under pressure of the backseam region of the upper and the heel seat region of the shoe respectively with a heel band and a holddown;

(ii) relieving the pressure between the backseam region of the upper and the heel band while maintaining clamping engagement between the heel seat region of the shoe and the holddown;

(iii) causing side lasting instrumentalities to move inwardly over the shoe bottom whereby lasting marginal portions of said side portions are wiped over and pressed against corresponding marginal portions of the insole;

(iv) with the side lasting instrumentalities thus pressing said lasting marginal portions of the upper, returning the heel band the backseam region of the shoe upper into pressing engagement and clamping the backpart of the shoe by means of the heel band; and

(v) with the backpart thus clamped, causing the heel seat wiper assembly to move inwardly over the last bottom whereby lasting marginal portions of the heel seat portion of the upper are wiped over and pressed against corresponding marginal portions of the insole.

4,593,424

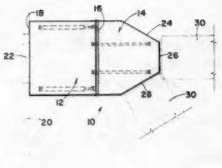
HYDRAULIC RAMP/DOCK/LOADER APPARATUS

Earl A. Beck, P.O. Box 308, Springdale, Ark. 72765-0308

Filed Dec. 30, 1983, Ser. No. 567,425

Int. Cl.[4] E01D *1/00*

U.S. Cl. 14—71.7 **3 Claims**



1. A variable height dock comprising:

a horizontal first framework structure for fixed support on the earth's surface or other support surface, the first framework structure having a forward end and a rearward end;

a second framework structure having a forward end and a rearward end, said second framework being pivotally supported by and attached to, extreme rear of the rear uppermost section of said first framework structure, said second framework structure having an upper surface covered by decking;

a platform section having a forward end and a rearward end, the rearward end being pivotally attached to said second framework structure forward end, the platform section having an upper surface covered by decking;

a supporting link member pivotally attached at one end to said first framework structure adjacent the forward end thereof and pivotally attached at the other end to said platform section adjacent the forward end thereof, said link member to be exact match in pivotal length to the pivotal length of the second framework structure, thus achieving the constant horizontal attitude of the platform section throughout full pivotal travel of the system;

a cylinder-piston member of conventional design pivotally affixed at one end to said first framework structure and at the other end to said second framework adjacent the forward end thereof, the cylinder-piston member being variable in length by the control of hydraulic or pneumatic fluid thereto whereby the elevation of the said forward end of said second framework structure may be varied, resulting in angular displacement of said second framework up to a full 90 degrees, the elevation of said platform section being thereby varied, the platform section remaining horizontal at all elevations regardless of the amount of cargo loading placed thereon, or whether in a raising, lowering, or holding mode, said second framework section providing a ramp from said horizontal platform section, ramp effect being horizontal when platform section is in the fully lowered position but becoming an inclined ramp as platform structure is raised;

a variable height dock for use with a structure having a floor and a doorway, said second framework structure rearward end being adjacent the structure doorway and said decking thereon being substantially equal the height of the structure floor at said second framework structure rearward end whereby said second framework structure decking provides an inclined ramp to the floor regardless of the height of said platform section, and wherein, when said second framework structure is raised to the vertical position, said decking thereon provides a complete doorway closure, said doorway closure is effective with or without the existance of an auxiliary adjacent structure door, said doorway closure effect by said second framework struc-

ture when utilized in conjunction with a conventional door, serves as a security door.

4,593,425

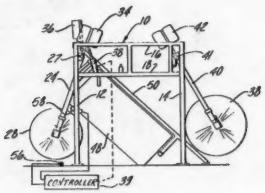
MULTIPLE BRUSH CARWASHER

David J. Bivens, Danville, Va., assignor to Bivens Winchester Corporation, Danville, Va.

Continuation of Ser. No. 587,587, Mar. 8, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 782,599

Int. Cl.[4] B60S *3/06*

U.S. Cl. 15—53 AB **7 Claims**



1. Vehicle washing apparatus comprising:

an open unitary gantry frame having forward and rearward ends and including

left and right upright longitudinally extending side frame structures, and

horizontal members extending transversely between said side frame structures adjacent the upper ends thereof to form a gantry structure to overly and accommodate a vehicle to be washed;

a first brush assembly positioned at the forward end of said frame and including

a first pair of straight rigid arms pivoted at their respective upper ends to adjacent, opposite sides of said frame adjacent the upper forward end of said frame and extending forwardly from said frame, and

a first brush positioned transversely between the lower ends of said first pair of arms;

a second brush assembly positioned at the rearward end of said frame and including

a second pair of straight rigid arms pivoted at their respective upper ends to opposite sides of said frame adjacent the upper rearward end of said frame and extending rearwardly from said frame, and

a second brush positioned transversely between the lower ends of said second pair of arms;

a pair of elongated left and right sides brushes positioned respectively adjacent to and within said left and right frame structures and extending obliquely from front to rear of said frame; and

means mounting said side brushes on said frame for self-adjusting lateral displacement relative to said frame in response to vehicle contact to accommodate vehicles of varying width.

4,593,426

LITTER COLLECTION APPARATUS

Barney D. Chrisley, Centerville, Va., assignor to Caravelle Industries, Inc., Manassas, Va.

Filed Nov. 25, 1983, Ser. No. 554,970

Int. Cl.[4] E01H *1/00*

U.S. Cl. 15—84 **34 Claims**

1. Litter collection apparatus, comprising:

a support frame;

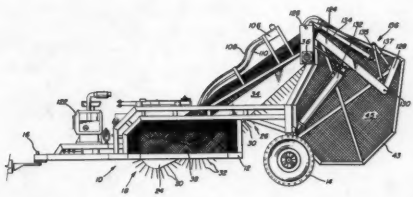
means for facilitating movement of said apparatus across a surface;

a receptacle mounted on said frame having a first opening for receiving litter;

a first roll having a plurality of litter contacting projections for contacting litter on said surface;

means for rotating said first roll;

an endless conveyor having a plurality of litter contacting second projections extending outwardly from the outer surface of said conveyor, said conveyor having a first end adjacent to said first roll and close to said surface so that said first projections on said first roll mesh with said second



projections on said conveyor and a second end supported on said frame adjacent said opening in said receptacle; and

means for rotating said conveyor in a direction opposite to the direction of rotation of said first roll whereby the projections on said first roll and the projections on said second roll cooperate to lift litter from said surface and said fingers on said conveyor transport litter to said receptacle.

4,593,427

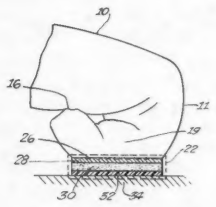
WATERPROOF SCOURING GLOVE

Thomas V. Ortolivo, 2211 NW. 41 Ave., Coconut Creek, Fla. 33066

Continuation-in-part of Ser. No. 452,196, Dec. 22, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 642,083

Int. Cl.[4] A47L *13/18*

U.S. Cl. 15—227 **8 Claims**



1. A waterproof scouring glove for cleaning rigid surfaces and having a flexible body including a palm, a thumb, and finger stalls, the finger stalls including a second row of phalanges in the mid-finger area, the scouring glove comprising:

an exterior palm side and an exterior knuckle side,

a plurality of abrading or cleaning units defining cleaning surfaces and adhered to only said exterior palm side and only said exterior knuckle side of said second row of phalanges and positioned entirely within the confines thereof,

whereby, the second row of phalanges may be utilized for forcibly applying pressure to said cleaning unit during scrubbing of a rigid surface when said glove is in the position of a clenched fist and, during such clenching, the second row of phalanges are capable of forcefully applying reciprocating action upon the rigid surface,

said abrading or cleaning units including a single upper exterior palm cleaning surface covering substantially the entire upper exterior palm and exterior palm side finger areas of the glove body; and

a single lower exterior palm cleaning surface covering substantially the entire lower palm area extending from the natural transverse crease in the palm to the top of the

wrist, wherein said upper and said lower-cleaning surfaces are separated by a transverse linear gap free of abrading or cleaning units disposed substantially at the location of the natural transverse crease of the palm;

whereby the capacity of the user to form a tight, clenched fist is enhanced by reason of such transverse linear separation between said upper and lower palm surfaces,

an absorption layer disposed between said cleaning surfaces and the flexible glove body;

whereby said absorptive layer may absorb water of a liquid solution of detergent for usage in combination with said cleaning surfaces;

said absorptive layer is adhered to the flexible glove body with a pressure-responsive adhesive.

4,593,428

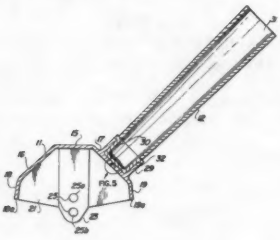
ROLLER PAINT GUARD ASSEMBLY

Peter W. Calvert, Johnson City, Tenn., assignor to Thomas Industries, Inc., Louisville, Ky.

Filed May 3, 1985, Ser. No. 730,690

Int. Cl.[4] B05C *17/02, 21/00*

U.S. Cl. 15—248 A **13 Claims**



1. In a paint roller apparatus for releasably receiving a paint roller, suspending the paint roller at least partially contained within an enclosure to shield an area adjacent the area being painted from inadvertent dripping or spraying of paint from the paint roller during use, the combination comprising:

a paint shield defining the enclosure;

a separate handle; and

paint roller mounting means including first and second end caps;

said paint shield including first and second opposing end walls and a wall portion extending between said end walls and having an elongated slit therethrough intermediate and extending between said end walls, connection means formed integrally with said paint shield on said wall portion, overlying said slit in communication therewith and extending outwardly from said wall portion, said first and second end caps being attached to opposite ends of said paint roller and each having a projecting shaft cooperating with said end walls to mount said paint roller axially of said paint shield for rotational movement about the axis of said paint shield;

said handle having a mounting end releasably received by said connection means to attach said handle to said paint shield, said mounting end being located to cover said slit when said handle is in place during use of the apparatus for painting, and said handle bring removable from said paint shield to permit a source of water under pressure to be connected to said connection means to discharge water into the shield through said slit to impact the paint roller causing it to rotate and simultaneously wash residual paint from the paint roller.

4,593,429

VACUUM CLEANING APPLIANCE

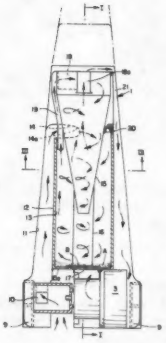
James Dyson, Bath, England, assignor to Prototypes, Ltd., Bath, England

Continuation of Ser. No. 452,917, Dec. 27, 1982, abandoned, which is a continuation of Ser. No. 274,252, Jun. 16, 1981, abandoned. This application Aug. 14, 1984, Ser. No. 640,758

Claims priority, application United Kingdom, Jun. 19, 1980, 8020041; Aug. 8, 1980, 8025960; Sep. 25, 1980, 8030964

Int. Cl.[4] A47L *5/30*; B01D *45/12*

U.S. Cl. 15—353 **14 Claims**



11. In a portable vacuum cleaning appliance for picking up dirt, the improvement which comprises:

(a) an outer cyclone comprising a bottom and a substantially cylindrical cyclone casing extending to and meeting said bottom, said cyclone casing defining a substantially cylindrical interior surface which acts as a substantially constant cross-sectional dirt rotation surface for said outer cyclone throughout its length and an upper portion spaced from the bottom, a first passage leading to a dirty air inlet provided at the upper portion of the cyclone casing leading into said casing and oriented to supply dirt laden air tangentially to and on the interior surface and an air outlet from the interior of the casing provided adjacent the upper portion of the cyclone casing;

(b) an inner cyclone having an upper end and a lower end smaller than the upper end disposed inside the outer cyclone and having a frusto-conical shape and with an opening at the lower end spaced from the bottom of the outer cyclone, the inner cyclone having an air inlet in communication through a second passage with the air outlet of the outer cyclone and oriented to supply air tangentially into the inner cyclone and an air outlet adjacent the upper end of the inner cyclone for outlet of clean air from the inner cyclone, the inner cyclone being separated from air flow connection with the outer cyclone except for the air inlet to the inner cyclone;

(c) a dependent portion positioned around the opening at the lower end of the inner cyclone and extending to the bottom of the outer cyclone for collecting dirt from the inner cyclone;

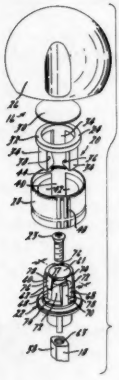
(d) fan means driven by a motor for generating an air flow mounted on the appliance which passes first through the first passage into the outer cyclone to remove larger dirt particles and then through the second passage to the inner cyclone to remove smaller dirt particles and then is removed as clean air; and

(e) means for picking up dirt connected to the first passage.

4,593,430
QUICK CONNECT FITTING FOR A FAUCET HANDLE AND THE LIKE

Anthony G. Spangler, Westfield, and Kenneth E. Myers, Indianapolis, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Nov. 30, 1982, Ser. No. 445,490
Int. Cl.⁴ B25G 3/28
U.S. Cl. 16—121 **6 Claims**



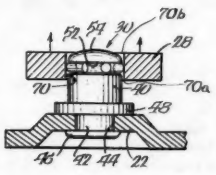
1. A fastener device for a faucet handle comprising:
a coupler member non-rotatably secured to an end of an operable stem;
a handle member having a receptor means for receiving said coupler member;
said receptor means having axially extending and resiliently flexible flanges, each flange having a radially extending shoulder;
said coupler member having a plurality of recesses to receive a shoulder of each flange;
said coupler member having a radially extending shoulder means axially interposed between said recesses and a free end of said coupler member and positioned to flex said flange in a radial direction when said shoulder of each flange axially passes thereby;
said recesses bounded at each side by a rib having an outer surface and having edges that engage a respective shoulder of each flange to prevent said receptor means from rotating relative to said coupler when said shoulders are received in said recesses;
means for flexing said shoulders outwardly from said recesses upon a downwardly directed force such that said receptor means becomes free to rotate about said coupler member with said shoulders engaging an outer surface of said rib and being free to be upwardly moved past said recesses and shoulder means of said coupler member to disengage said receptor means from said coupler member; and said outer surface of said rib positioned radially with respect to each flange to maintain said flange in a flexed position when said flange is engaged thereto.

4,593,431
SNAP STUD

Christopher T. Sandberg, Owatonna, and Gary F. Paulson, Waseca, both of Minn., assignors to Truth Incorporated, Owatonna, Minn.

Continuation of Ser. No. 589,307, Mar. 14, 1984, abandoned. This application Jun. 19, 1985, Ser. No. 746,443
Int. Cl.⁴ E05D 5/12
U.S. Cl. 16—381 **6 Claims**

1. A releasable connection means comprising: a snap stud for mounting on a first member; and a second member having a through opening and defining at an end thereof an annular edge having a substantially right angle cross section, said snap stud extending through said opening for releasably holding said second member in pivotal relation with said first member, said snap stud comprising a generally cylindrical stud having an external peripheral groove intermediate the ends of the stud, and a C-ring of spring wire defining an annular centerline positioned in said peripheral groove and having a pair of spaced-apart ends, said C-ring having inner and outer diameters selected to have a part thereof in said peripheral groove

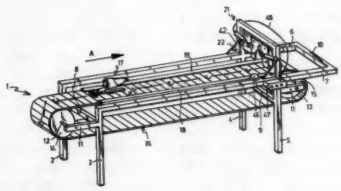


and a part extending beyond the stud periphery when said C-ring is in a retention position, the diameter of said edge of the opening of the second member being less than the outer diameter of the C-ring and greater than the diameter of said annular centerline of the C-ring when the C-ring is in said retention position, and said peripheral groove having a depth to enable compression of the C-ring to a release position in which substantially all of the C-ring is in said peripheral groove and which enables disassembly of said pair of members by pulling one member away from the other axially of the stud.

4,593,432
FILLETING APPARATUS

Jacobus E. Hazenbroek, Numansdorp, Netherlands, assignor to Systemate Holland B.V., Netherlands

Filed Jul. 13, 1984, Ser. No. 630,658
Claims priority, application Netherlands, Jul. 13, 1983, 8302494
Int. Cl.⁴ A22C 21/00, 25/16
U.S. Cl. 17—46 **24 Claims**



1. Filleting apparatus for removing the fillets from previously eviscerated poultry carcasses of which the legs, wings and the skin have been removed already, said apparatus comprising a drivable conveyor mounted on and movable about said frame, a plurality of carcass retaing means mounted on said conveyor at spaced intervals and movable along a path about said frame, each said retaining means including a carcass moulding portion that is sized and shaped to approximately fit the previously eviscerated body cavity of a poultry carcass so that the body cavity of a poultry carcass can be mounted on and carried along the path by each retaining means with the moulding portion maintaining the shape of the body cavity, a gate member mounted along the path of said retaining means and including a passage therethrough the corresponds to the profile of the skeletal structure of the poultry carcasses, whereby when a poultry carcass is carried by a retaining means through the passage of the gate member the fillets are separated from the carcass.

24. A method of filleting previously eviscerated poultry carcasses comprising mounting a plurality of poultry carcasses on a series of carcass retaining means which correspond in size and shape to the cavity of the skeletal structure of the poultry carcass so as to mould the visceral cavity of the poultry carcass to a predetermined size, moving the carcass retaining means each with a poultry carcass mounted thereon through a gate that defines a passage therethrough that corresponds to the profile of the skeletal structure of the poultry carcasses moved throuh the gate, and as each poultry carcass passes through the gate, engaging and stripping with the gate the meat from the skeletal structure of the poultry carcass.

4,593,433

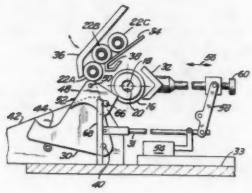
STUFFING APPARATUS AND METHOD

Joseph A. Nausedas, Oak Forest, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 675,183, Nov. 27, 1984, abandoned. This application Mar. 8, 1985, Ser. No. 709,909

Int. Cl.[4] A22C *11/02*

U.S. Cl. 17—49 **16 Claims**



13. A stuffing method comprising the steps of:

(a) receiving an elongated casing article onto a carrier and supporting the article with its longitudinal axis parallel to and laterally spaced from a stuffing axis of a stuffing machine, the casing article constituting an elongated stuffing tube and a shirred casing on the tube having the pleats thereof gripping about the tube;

(b) moving the casing article transverse to its longitudinal axis from said receiving position and towards said stuffing axis until the longitudinal axis of the casing article coincides with said stuffing axis;

(c) holding the casing article at said stuffing axis and communicating an end of the stuffing tube to a stuffing outlet of the stuffing machine, and thereafter releasing the casing article from the carrier and passing foodstuff through said outlet and into the stuffing tube to stuff and remove casing from the stuffing tube;

(d) disconnecting the stuffing tube from said outlet after all the casing has been stuffed and removed from the tube;

(e) returning the stuffing tube to the carrier and moving the carrier and the stuffing tube thereon in a reverse direction away from said stuffing axis and back towards said receiving position; and

(f) discarding the stuffing tube from said carrier in the course of moving the stuffing tube in said reverse direction.

4,593,434

CASING SUPPORT FOR PRODUCT ENCASING MACHINE AND METHOD FOR USING SAME

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Feb. 21, 1985, Ser. No. 704,302

Int. Cl.[4] A22C *11/02, 11/10*

U.S. Cl. 17—49 **15 Claims**

1. A casing support for supporting a product casing on a product encasing machine, said casing support comprising:

an elongated hollow tube having a longitudinal bore extending therethrough, said bore having a forward first open end and a rearward second open end,

said hollow tube having an outer surface for receiving said product casing thereon;

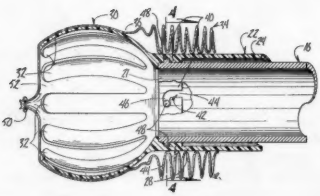
chuck means on said outer surface of said tube for engaging the interior surface of said casing to provide rotational force to said casing when said tube is rotated, and for providing longitudinal drag to said casing to yieldably resist movement of said casing in a forward direction;

means for detachably securing said tube to said product encasing machine for holding said tube against at least longitudinal movement with respect to said product encasing machine;

said chuck means comprising a plurality of elongated fingers arranged in spaced relation to one another around the circumference of said tube, each of said fingers having a forward end and a rearward end, said rearward end being connected to said tube, each of said fingers extending radially outwardly and forwardly from said rearward end and being arcuate in shape along the distance from said forward end to said rearward end so as to provide a smooth continuous surface for engaging said interior of said casing.

13. A method of making an encased product comprising:

mounting a shirred casing having opposite ends on an elongated hollow tube having a rear opening on a rearward end and a chuck means on the other forward end, said chuck means comprising a plurality of fingers arranged in spaced relation to one another around the circumference of said tube, each of said fingers having a rearward finger end connected to said tube and extending radially outwardly and axially forwardly from said rearward finger end to a forward finger end, each of said fingers being arcuate in shape along the distance from said forward finger end to said rearward finger end so as to provide a smooth continuous surface for engaging the interior of said casing;



pulling one of said opposite ends of said shirred casing forwardly over said chuck means;

mounting said elongated tube to a product encasing machine adapted to force product through said chuck means;

forcing product forwardly through said chuck means and into said casing whereby said casing will be filled and be continuously drawn forwardly over said chuck means,

rotating said tube during the time that product is forced through said chuck means whereby said chuck means will impart rotational movement to said casing and will provide a yieldable dragging force to said casing to yieldably resist forward movement of said casing.

4,593,435

APPARATUS AND METHOD FOR THE TRANSVERSE HALVING OF POULTRY CARCASSES

Eugene G. Martin, New Holland, and Dale M. Risser, Denver, both of Pa., assignors to Favorite Manufacturing, Inc., New Holland, Pa.

Continuation-in-part of Ser. No. 471,295, Mar. 2, 1983, abandoned. This application Apr. 15, 1983, Ser. No. 485,311

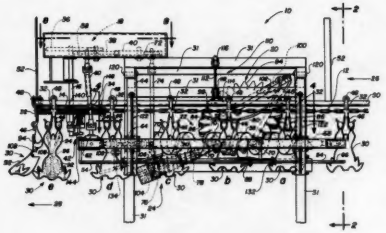
Int. Cl.[4] A22C *21/00*

U.S. Cl. 17—52 **36 Claims**

31. A method of cutting poultry carcasses as a plurality of

the carcasses are moved in series in an inverted attitude by an overhead conveyor along a path comprising rotating a wheel member about an axis with its peripheral edge moving in timed relationship with respect to the movement of the carcasses, inserting a protrusion of the wheel member into the body cavity of each poultry carcass, carrying the poultry carcass with the protrusion past a substantially stationary knife element, and cutting the poultry carcass with the knife element between the keel and the thigh bones toward the backbone.

35. Apparatus for cutting poultry carcasses between the keel and the thigh bones toward the backbone as the poultry carcasses are moved along a predetermined path by an overhead



conveyor suspended in an inverted attitude, said apparatus comprising a wheel member rotatably supported on an axis approximately normal to the path of the carcasses, said wheel member including a series of protrusions at circumferentially spaced intervals thereabout with the protrusions sized and shaped to project into the cavities of poultry carcasses moving along the predetermined path, and a stationary knife member positioned in the predetermined path of the carcasses in juxtaposition with said wheel member at the protrusions of said wheel member whereby the protrusions carry the poultry carcasses to the knife member and the knife member cuts through the poultry carcasses.

4,593,436

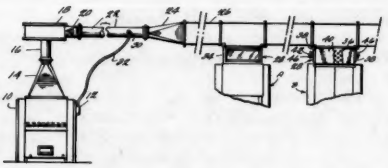
BAFFLED WEBFORMER AND SYSTEM

W. D. Burgess, Dallas; Glenn E. Lytton, and Ronald S. Nash, both of Gastonia, all of N.C., assignors to Fiber Controls Corporation, Gastonia, N.C.

Continuation of Ser. No. 106,359, Dec. 21, 1979, abandoned. This application Sep. 4, 1985, Ser. No. 773,092

Int. Cl.[4] D01G *15/40*

U.S. Cl. 19—105 **5 Claims**



1. A webformer for removing fibers from a duct carrying a stream of air with textile fibers entrained therein and forming a web of said fibers, comprising:

means including a chute for feeding said web to subsequent equipment,

means for feeding fibers into said chute as required by the chute,

reserve chamber means for receiving fibers at an upper level from said conduit and presenting them at a lower level to said feeding means,

said reserve chamber means having substantially air tight vertical walls except for one wall having a substantial area which is substantially perforated with a multiplicity of spaced holes that will exude air but not said fibers whereby fibers received with exuded air will drop downward in said reserve chamber means toward said feeding means, and

an air deflector plate having a solid area coextensive with said perforated wall area and spaced therefrom for controlling the amount of air that can be exuded from substantially all areas of said perforated wall.

4,593,437

CARD FLATS SEGMENT

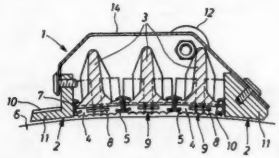
Ralph Graf, Freienbach, and Werner Bisquolm, Siebnen, both of Switzerland, assignors to Graf & Cie. A.G., Rapperswill, Switzerland

Filed Feb. 14, 1985, Ser. No. 701,382

Claims priority, application Switzerland, Feb. 14, 1984, 716/84

Int. Cl.[4] D01G *15/24*

U.S. Cl. 19—113 **11 Claims**



1. A card flats segment intended for a rigid mounting to a carding machine, comprising a plurality of supporting members integrated in a frame, which supporting members are arranged directly adjacently succeeding each other in the direction of the carding and extend at least across the width of the card, each supporting member being designed for a releasable receipt of sawtooth card clothing wires forming the card clothing and lined up thereupon across mentioned width of the card, each individual supporting member being arranged to be independently adjustable regarding distance and angle of pitch relative to the circumference of the main drum.

4,593,438

SPINNING MACHINE DRAFTING ROLLER ADJUSTING ARRANGEMENT

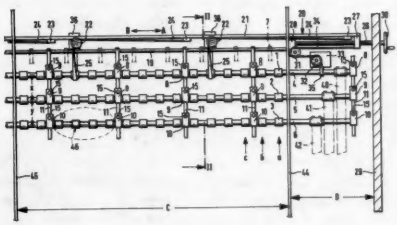
Norbert Barauke, Donzdorf, Fed. Rep. of Germany, assignor to Hans and Fritz Stahlecker, Fed. Rep. of Germany

Filed Oct. 4, 1984, Ser. No. 657,513

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3336038

Int. Cl.[4] D01H *5/34, 5/56*

U.S. Cl. 19—261 **18 Claims**



1. Spinning machine having a plurality of drafting apparatusses for drafting sliver to be spun, each drafting apparatus comprising a plurality of upper and lower drafting roller means arranged in pairs, said pairs being spaced from one

another in the travel direction of sliver being drafted thereby, said lower drafting roller means including:

at least three lower drafting roller cylinder means extending in a machine longitudinal direction transverse to the sliver travel direction,

a plurality of in the machine longitudinal direction spaced bearing seats for each of said at least three lower drafting roller cylinder means,

bearing seat attaching means for detachably fixedly attaching said bearing seats to respective guide carrier means such that the bearing seats together with the respective lower drafting roller cylinder means can be moved along the carrier means to adjust the spacing between said at least three lower drafting roller cylinder means,

and central control device means including linking means engageable at a plurality of longitudinally spaced positions of said lower drafting roller cylinder means to facilitate simultaneous adjusting movement of said at least three lower drafting roller cylinder support means with respect to each other and in the travel direction of sliver.

4,593,439

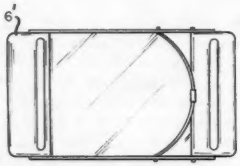
BUCKLE FOR BELT

Sergei Babarin, 21-57 Holland Ave., Apt. L, Bronx, N.Y. 10462

Filed Nov. 5, 1984, Ser. No. 669,256

Int. Cl.[4] A44B *11/00*

U.S. Cl. 24—197 **5 Claims**



1. A buckle for a belt, comprising a central plate having two longitudinal sides and two transverse sides, said plate is provided with two projections each located at a respective one of said longitudinal sides and each having three openings spaced from one another in a longitudinal direction and including two end openings and a middle opening located therebetween; two connecting members each having two longitudinal sides and two transverse sides and each connecting a respective end of a belt to said plate, each of said connecting members is provided with means for adjustably connecting with a respective end of a belt, each of said connecting members is also provided at each longitudinal side with a pin, each of said pins of one of said connecting members being pivotably and nonremovably engaged in one end opening of a respective one of said projections of said plate, each of said pins of the other of said connecting members being engageable in a pivotable and removable manner in the other end opening of a respective one of said projections of said plate, at least one of said other end openings being elongated and said other connecting member being insertable by first placing said other connecting member in an inclined position relative to said projections and then turning said other connecting member in a position parallel to said transverse sides of said plate; and means for retaining said other connecting member in engagement with said plate and including a flat spring which engaged spring-biases said other connecting member, said spring having two end pins each engaging in said middle opening of a respective one of said projections of said plate, so that said one connecting member, said spring and said other connecting members are held in said projections by engagement of said pins into said openings.

4,593,440

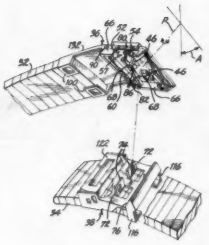
CLASP WITH POSITIVE LATCH MECHANISM

Anton Tsamas, Hackensack, N.J., assignor to True-Lok Inc., Lodi, N.J.

Continuation-in-part of Ser. No. 633,336, Jul. 23, 1984, and a continuation-in-part of Ser. No. 670,047, Nov. 13, 1984. This application Sep. 11, 1985, Ser. No. 774,978

Int. Cl.[4] A44B *11/00*

U.S. Cl. 24—265 WS **20 Claims**



1. A clasp for connecting together juxtaposed, longitudinally-extending first and second band segments to secure selectively an ornamental item, such as a watch band, upon a wearer, the clasp comprising:

a first clasp member;

first attaching means for attaching the first clasp member to the first band segment;

the first clasp member including a first platform portion extending in directions generally parallel to the longitudinal extent of the first band segment, and at least one pair of first latching members carried by the first platform portion and extending generally perpendicular to the first platform portion;

a second clasp member;

a second attaching means for attaching the second clasp member to the second band segment;

the second clasp member including a second platform portion extending in directions generally parallel to the longitudinal extent of the second band segment, and at least one pair of second latching members carried by the second platform portion and extending generally perpendicular to the second platform portion;

pivot means mounting at least one of said pairs of first and second latching members for rotation relative to the other of said pairs of first and second latching members upon juxtaposition of the band segments and overlapping of the first and second clasp members, such that the latching members couple together the first and second clasp members in response to overlapping the first and second clasp members; and

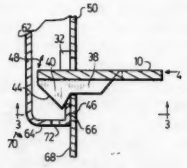
operator means carried by one of the first and second clasp members and coupled with at least one of said pairs of first and second latching members for movement of that pair of latching members in response to selective manual movement of the operator means such that the latching members are disengaged to uncouple the overlapped first and second clasp members, so as to disconnect selectively the juxtaposed first and second band segments and release the ornamental item from the wearer.

4,593,441

RETAINER CLIP

Robert M. St. Louis, St. Leonard, Canada, assignor to Camco Inc., Mississauga, Canada

Filed Apr. 30, 1985, Ser. No. 729,045
Claims priority, application Canada, Dec. 7, 1984, 469641
Int. Cl.[4] A44B 21/00
U.S. Cl. 24—297 16 Claims



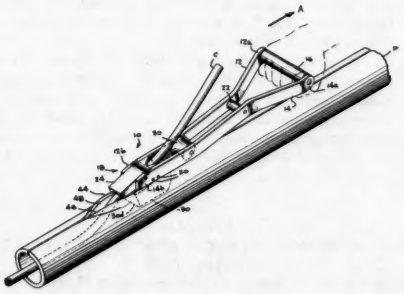
1. A one piece substantially planar substantially W-shaped resilient plastic clip having a pair of opposite faces and formed by a pair of laterally spaced outside legs interconnected at one end by a bridging section and having an intermediate member extending from the bridging section between said leg members while providing a free space between each of said leg members and said intermediate member, notches on the side of each of said leg members remote from said intermediate member, said notches being provided adjacent the free end of said legs, each of said leg members being resiliently flexible for movement into its adjacent said space to permit said notches to snap into position wherein said notch moves over an edge of a panel on which said clip is to be mounted and receives a portion of said panel in said notch, said intermediate member being provided with a catch means extending from one of said opposite faces of said substantially planar clip adjacent the end of said intermediate member remote from said bridging section, said intermedate member being resiliently flexible for movement in a driection substantially perpendicular to the direction of movement of said leg members to permit movement of said catch means into and out of a catching position.

4,593,442

CABLE INSTALLATION APPARATUS

Curtis M. Wright, Ellis Hill Rd., Dundee, N.Y. 14837, and Charles Wray, 56 E. Green Woods St., Andover, N.Y. 14806

Filed Jun. 17, 1985, Ser. No. 745,076
Int. Cl.[4] B23P 19/02
U.S. Cl. 29—235 20 Claims



1. Apparatus for manually separating a conduit of resilient material having a pre-cut longitudinal slit therein and inserting a flexible line therein, comprising:

a pair of arms, each of said arms having a handle end and a head end;

a handle disposed between and joining said handle ends for gripping said apparatus in operation; and

a head disposed between and attached to said head ends for separating the slit in the conduit and inserting the line through the slit, said head comprising:

a removable top half having a first semicircular groove therein and a bottom half on which said top half is positioned for normal use and comprising:

a separating member for separating the slit in the conduit;

a guide shoe disposed beneath said separating member and having an upper surface generally conforming to the upper inner surface of the conduit for guiding said separating member along the conduit; and

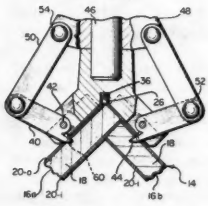
means defining with said separating member a second semicircular groove, whereby when said top half is placed over said bottom half, said first and second semicircular grooves form a substantially circular channel for guiding the line through said separating member at an angle to said arms and into the conduit.

4,593,443

TOOL FOR CRIMPING A CORNER BEAD PIECE OVER AN EXTERIOR PLASTERBOARD CORNER

Richard P. Wolford, 21 Kristin Pl., Apt. 1014, Schaumburg, Ill. 60195

Filed Oct. 4, 1985, Ser. No. 784,690
Int. Cl.[4] B23P 11/00
U.S. Cl. 29—243.5 11 Claims



1. A tool for crimping a corner bead piece to an underlying exterior structural corner, comprising the combination of

two elongated arms defining spaced pads angled at a substantially right angle to one another across an interior corner,

a crimping pin carried relative to each arm, operable in one position to lie recessed behind a respective pad and in another position to have a die end project outwardly beyond the same pad,

means including a striker, and linkage connecting the striker to the crimping pins operable to tie the movement of the striker to associated movements of the crimping pins,

said striker being adapted to be hit with a mallet or the like to drive the crimping pins against an underlying corner bead piece and into the corner structure, to crimp parts of the corner bead piece into the corner structure to secure the corner bead piece thereto, and

magnet means carried on the tool and having outer faces that are substantially coplanar with the respective tool pads,

said magnet means being adapted to cooperate flush with one part of the corner bead piece and hold the corner bead piece as positioned in place on the tool, operable to allow the one-hand manipulation of the tool and corner bead piece as the corner bead piece is first being positioned over the exterior structural corner and prior to crimping with the tool.

4,593,444

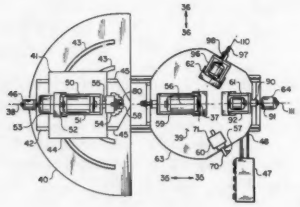
MACHINE FOR MANUFACTURING UNIVERSAL JOINTS

Keshav S. Kavthekar, 43150 Leeds Ct., Canton, Mich. 48188

Continuation of Ser. No. 288,320, Jul. 30, 1981, abandoned. This application Dec. 20, 1983, Ser. No. 563,263

Int. Cl.[4] B23Q *3/02;* **B23C** *1/12*

U.S. Cl. 29—27 C **15 Claims**



1. A machine for making universal joints wherein multiple machining operations are performed on different corresponding members of a universal joint, held in a common workhead and revolved about common axes conforming to the universal joint comprising: a base; a workhead rotatably carried on the base, said workhead having a housing, a spindle rotatably mounted in the housing, the axis of said spindle being in perpendicular and intersecting relationship to the workhead axis, and a workholder attached to one end of the spindle having plural means adapted for holding the different corresponding members of a universal joint and moving the members with the same motion as the spindle such that the members revolve about axes conforming to the universal joint; a means for swiveling the workhead about the axis thereof; a means for revolving the spindle about the axis thereof; a means for indexing the spindle about the axis thereof; a means for locking the spindle to the workhead housing; a longitudinal tool slide table carried on the base for movement parallel to the spindle axis; a means for moving the longitudinal tool slide table; a tool index table carried on the longitudinal tool slide table for supporting a plurality of machining stations; a means for rotatably indexing the tool index table about the axis thereof; a plurality of machining stations mounted on the tool index table, each of the stations having a cutting tool for machining the different corresponding members of the universal joint held in the workholder; and a means for controlling the motions of the workholder and cutting tools of the machining stations.

4,593,445

APPARATUS AND PROCESS FOR REFURBISHING VALVES

David A. Snyder, N. Huntingdon Township, Westmoreland County, Pa., and David M. Glosecki, Taylor Springs, Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1984, Ser. No. 670,774

Int. Cl.[4] B21D *53/00;* **B23K** *9/04;* **B23P** *6/00;* **B23Q** *15/00*

U.S. Cl. 29—157.1 R **36 Claims**

1. Apparatus for remotely refurbishing a generally circular valve seat of a valve, comprising:

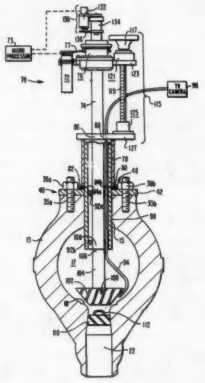
(a) a welding assembly having a welding head for depositing a circular bead of metal around the valve seat, and a positioning assembly connected to said welding head and detachably mountable onto the valve body for axially, angularly and radially positioning the welding head along a desired point of the axis of rotation of the generally circular valve seat, and

(b) a control means operatively connected to said positioning assembly for controlling the angular, radial and axial movement of the welding head relative to the generally circular valve seat, including:

(i) a microprocessor electrically connected to the positioning assembly which has a memory for storing movement instructions for the positioning assembly so that, once said welding head is initially positioned at a starting position with respect to the valve seat, said welding assembly sequentially deposits at least one bead of welding material around the valve seat, and

(ii) means for remotely visually observing said welding head within said valve body for allowing a welding operator to place said welding head at said starting position prior to the commencement of said movement instruction by said microprocessor, and to visually monitor the movement of said welding head after the commencement of said movement instructions.

25. A process for refurbishing a generally circular valve seat of a valve with a welding assembly including a welding head, a positioning assembly having motor means for angularly and radially moving the welding head along the axis of rotation of the valve seat, means for remotely observing the position of said welding head within the body of the valve, and a micro-



processor electrically connected to said motor means and having a memory for storing movement instructions for the positioning assembly, comprising the sequential steps of:

(a) disassembling the valve to provide access to the valve seat;

(b) grinding down the valve seat;

(c) detachably mounting the welding assembly onto the body of the valve;

(d) using the positioning assembly and the remote observation means to radially position the welding head adacent to the valve seat at an initial starting position along the axis of rotation of the valve seat;

(e) automatically depositing at least one head of metal around the valve seat by actuating the microprocessor to instruct the position assembly to angularly move the welding head around the circumference of the valve seat, and

(f) monitoring the operation of the welding head as the beads are deposited around the valve seat through the remote observation means.

4,593,446

METHOD OF MANUFACTURING A FLUID FLOW RESTRICTOR

Paul F. Hayner, 52 Sentry La., Merrimack, N.H. 03054

Filed Apr. 18, 1984, Ser. No. 601,770

Int. Cl.[4] B21D *53/00;* **B23K** *31/02;* **F15D** *1/10*

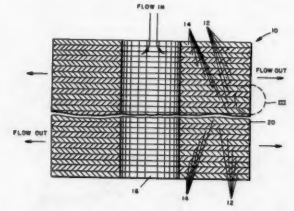
U.S. Cl. 29—157 R **20 Claims**

1. The method of manufacturing a fluid flow restrictor comprising the steps of:

(a) forming a plurality of annular first plates having an inside radius R1 and an outside radius R2;

(b) forming a plurality of annular second plates having an inside radius R1 and an outside radius R2;

(c) punching said first plates to form tabs therein defining a radial tortuous path wherein said tabs are of substantially equal height and substantially at right angles to the plane defined by one of said first plates, said tabs lie substantially along circles concentric with the center of said first plates and said tabs of each circle are substantially equally radially spaced and each disposed on a respective radius of the said first plate on which said respective tab is formed



which radius is disposed substantially between a pair of said tabs in the next adjacent circle of said tabs;

(d) forming a stack of said first and second plates wherein said plates are substantially concentrically aligned, said tabs are substantially longitudinally aligned and face substantially in the same direction, and said first and second plates are alternated; and,

(e) bonding said first and second plates and tabs together at their points of contact to form a flow restrictor having a central cylindrical bore connected to an outside cylindrical surface by a plurality of radial tortuous paths.

4,593,447

THREADING DEVICE

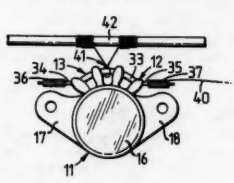
Alan W. Tupper, Chippenham, England, assignor to Latchways Limited, Chippenham, England

Filed Aug. 16, 1985, Ser. No. 766,769

Claims priority, application United Kingdom, Sep. 10, 1984, 8422818

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—241 **10 Claims**



1. A threading device comprising:

a wheel having a series of recesses at spaced locations around its periphery defining projecting portions of the wheel therebetween, the wheel comprising two parts having confronting side surfaces and each part having corresponding recesses and projecting portions as aforesaid with the recesses and projecting portions of the two parts being aligned with one another;

a support on which said wheel is rotatably located;

a rod-like threading member having a generally arcuate central portion and elongate end portions projecting from respective ends of the central portion;

the confronting surfaces of said projecting portions of said wheel parts having corresponding arcuate grooves therein in which said arcuate central portion of the threading member engages to be slidably retained therein with said elongate end portions projecting from respective sides of the wheel;

at least one of said elongate end portions of the threading member having means for releasably securing thereto an end portion of a flexible elongate member to be threaded by use of the device;

whereby, when an elongate end portion of the threading member is engaged with an element with which said flexible elongate member is to be threaded, said element can engage in one of said recesses in the wheel which can then rotate about its axis relative to the threading member thereby allowing the threading member to pass through or beneath said element to thread said flexible elongate member, which is attached to the other elongate end portion of the threading member with respect to said element.

4,593,448

METHOD FOR TIGHTLY JOINTING A SLEEVE TO A SUBMARINE PIPE LAID AT GREAT DEPTH

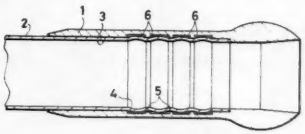
Gian P. Ferrari Aggradi, Barberino di Mugello, and Giampaolo Bonfiglioli, Inzago, both of Italy, assignors to Nuovo Pignone S.p.A., Florence and Snam S.p.A., Milan, both of, Italy

Filed Mar. 13, 1985, Ser. No. 711,362

Claims priority, application Italy, Mar. 14, 1984, 20046 A/84

Int. Cl.[4] B21D *39/08*

U.S. Cl. 29—523 **2 Claims**



1. Method for tightly jointing a sleeve to a submarine pipe laid at great depth, comprising the successive steps of mounting the sleeve on the free end of said pipe, of inserting a particular plug expander of hard rubber inside the pipe-sleeve assembly, of axially compressing and continuing to axially compress said plug in order to radially expanding the said pipe-sleeve assembly up to the limit of elastic deformation of the material constituting the sleeve, which is greater than that of the pipe, and of decompressing and extracting said plug from said pipe, characterized in that it comprises also the preliminary steps of shaping the inner surface of the sleeve with a sequence of grooves and of toothings, as well as of fitting each groove of the sleeve with two half-rings made with a material which is practically indeformable or deformable to a practically negligible extent under normal pressures, but collapses with a drastic reduction, greater than 70%, of its volume, under high pressures of the order of 300 kg/cm^2.

4,593,449

MANUFACTURE OF FOAM-FILLED PANELS AND CORES THEREFOR

Andrew G. Meray-Hovarth; Ricky W. Myers, both of Oakville, and Robert A. A. Palmberg, Toronto, all of Canada, assignors to M.P.M. Industries Inc., Oakville, Canada

Filed Jun. 4, 1984, Ser. No. 617,034

Int. Cl.[4] H01C *1/03*

U.S. Cl. 29—527.1 **11 Claims**

1. Method of making a foamed, cored panel, the method comprising the steps:

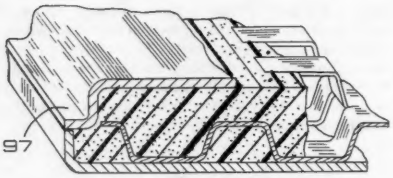
of forming a sandwich of two skins (64,65) and a core (62) placed between the skins;

where the sandwich has these characteristics;

that the core is so shaped and arranged with respect to the skins that when viewed from an edge of the panel the sandwich presents the appearance of a series of open-ended, straight-through tubes (66);

that the walls of such a tube are not closed or continuous but are provided with many openings along the length of the tube;

that the openings are of such a size, position, and nature, that the tube is substantially open to neighbouring tubes and to the skins;



of injecting, into the tubes thus presented, the ingredients of plastic foam in liquid form;

of causing the ingredients to foam and to substantially fill the tubes and all spaces between the skins, and to adhere to the core and to the skins;

and of allowing the foam to cure and become hard.

4,593,450

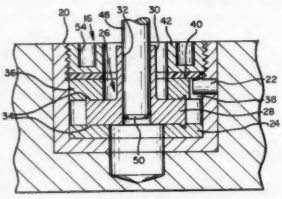
PRECISION LOCK TOOLING

Darrell L. Dumire, Sandy, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 13, 1984, Ser. No. 670,092

Int. Cl.[4] B23Q *1/06*

U.S. Cl. 29—559 **7 Claims**



1. A method of establishing a locating aperture in a circuit board drill tooling plate of a drill that comprises;

providing in a tooling plate a bushing cavity having a bottom surface and a designated lateral dimension, providing in the cavity an inner bushing having a lateral dimension less than the cavity dimension for limited free sliding movement thereof within the cavity, providing a clamping washer over the inner bushing having the same lateral dimension as the cavity, and providing locking means responsive to a vertical pressure to lock the inner bushing in place relative to the tooling plate,

positioning the inner bushing at a desired location within the cavity by the insertion therein of a locating pin carried by the drill, and applying vertical pressure to the washer and thereby to the locking means to lock the position of the inner bushing within the bushing cavity.

4,593,451

APPARATUS FOR CLEANING LARGE PIPE THREADS

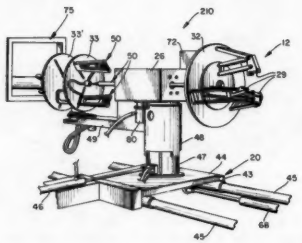
Royce G. Roberts, P.O. Box 1296, Kenai, Ak. 99611

Continuation-in-part of Ser. No. 414,989, Sep. 3, 1982, which is a continuation of Ser. No. 197,895, Oct. 17, 1980, abandoned, which is a continuation of Ser. No. 965,908, Dec. 4, 1978, Pat. No. 4,262,410. This application Mar. 21, 1983, Ser. No. 477,027

The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.

Int. Cl.[3] B08B *9/02*; B23P *19/04*

U.S. Cl. 29—560 **15 Claims**



1. A tool for sequentially removing a pipe thread protector and thereafter cleaning threads located on the opposed marginal ends of a pipe comprising:

a main frame, a shaft means supported in journaled relationship respective to said main frame, means for rotating said shaft means; an arm actuating member;

a plurality of arms, means by which said arms are connected to be rotated by said shaft means, a jaw connected to the distal end of each arm for releasably engaging a protector;

means for moving said main frame axially, laterally, and vertically respective to the longitudinal axis of said shaft means to thereby align said jaws for engagement with said protector;

means for pivotally moving said arms in response to movement of said arm actuating member to cause said jaws to move radially from a protector releasing into a protector engaging position;

a cleaning tool mounted to said main frame for engaging and cleaning the opposed marginal ends of a pipe, said tool includes a horizontal shaft having opposed ends, a first and second opposed plate member having central axis thereof attached to said horizontal shaft, means for imparting rotational motion into said horizontal shaft so that each said plate member rotates about the central axis thereof;

a vertical shaft means, a support means attached to said main framework for supporting said vertical shaft means for rotation about the longitudinal axis thereof; journal means by which a medial length of said horizontal shaft is rotatably supported by said vertical shaft; so that said horizontal shaft ends can be rotated about said vertical shaft means to describe a plane within which the horizontal shaft lies;

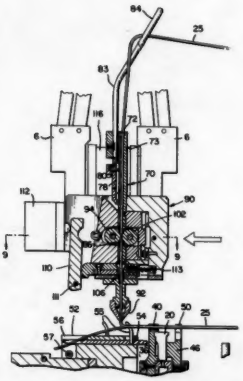
a plurality of cleaning brushes, means mounting said brushes on said first and second plate members, said brushes on each plate member are radially positioned respective to said horizontal shaft and circumferentially arranged respective to one another, means for adjustably positioning said brushes of each plate member respective to one another; the brushes located on a face of one plate member are positioned in opposition to the brushes located on the face of the other plate member; means for rotating said vertical shaft about the longitudinal axis thereof, thereby rotating the horizontal shaft in a horizontal plane and reversing the relationship of the first and second plate members respective to one end of the main frame, whereby;

the brushes located on one plate member can engage and clean external pipe threads, while the brushes on the other plate member can engage and clean internal pipe threads.

4,593,452
ROBOTIC HARNESS MAKER

Sammie G. Keahey, Landenberg; Alan S. Keizer, Mt. Gretna, and Thomas T. Lobb, Lansdale, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 26, 1985, Ser. No. 705,596
Int. Cl.[4] H01R *43/00*; B21F *27/00*
U.S. Cl. 29—564.6 **8 Claims**



1. A harness making apparatus for manufacturing harnesses of the type comprising a plurality of multicontact connectors having terminals therein and wires extending between the connectors and connected to the terminals, the apparatus being of the type comprising a harness board, a plurality of wire and connector jigs which are mountable on the board at locations corresponding to the positions of the connectors in the completed harness, each jig having connector holding means and wire locating means for locating wires adjacent to the terminals in a connector held in the jig, and a connecting tool cooperable in turn with each of the jigs and effective to connect the wires in the wire locating means in each jig to the terminals in the connector in the jig, the apparatus further comprising

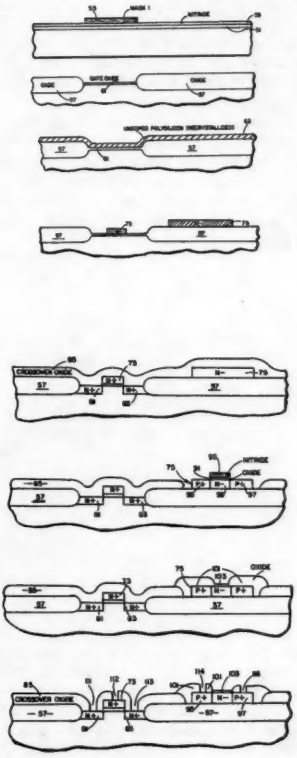
a programmed robot having gripping means positioned above the board and movable in the XYZ directions with respect to the board, and

a wire dispensing assembly which is handled by the robotic gripping means, the robot being programmed to move the wire dispensing assembly along a predetermined path to locate the wire while wire is dispensed from an endless source, said assembly comprising a wire dispenser holder and a wire dispenser received therein, said wire dispenser having a first wire receiving end, a second wire dispensing end, and wire guide means extending between said ends, said dispenser receiving wire at said first end from said endless source and dispensing wire from said second end for placement in said jigs, said dispenser being elongate in form and being received in said holder with said second end toward said board, said guide means comprising tube means through said dispenser, said holder having a placement head with a passage therethrough which receives said wire therethrough from said second end of said dispenser and locates said wire in said jigs, said holder having a pair of wire feed wheels acting on wire in said tube means through apertures in opposed walls of said dispenser, said dispenser being thin in cross section between said feed wheels.

4,593,453
TWO-LEVEL TRANSISTOR STRUCTURES AND METHOD UTILIZING MINIMAL AREA THEREFOR

Matthias L. Tam, Monterey Park, and Frank Z. Custode, Norco, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 383,395, Jun. 1, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,773
Int. Cl.[4] H01L *29/78, 21/425*
U.S. Cl. 29—571 **2 Claims**



1. A method for manufacturing complementary self-aligned NMOS and PMOS stacked transistors using a P doped silicon substrate, comprising the steps of:

selectively growing field oxide around an active area on a first surface of the substrate;

growing a gate oxide over the active area;

depositing a layer of undoped polysilicon over the first surface, followed by recrystallization of the polysilicon;

doping the polysilicon N—;

delineating an N gate region for the NMOS transistor being formed from the polysilicon layer and an active area from the polysilicon layer on the field oxide for the PMOS transistor being formed;

outlining the NMOS active area for the NMOS transistor being formed;

ion implanting N+ dopant in the outlined NMOS area includ-

ing the drain and source, and enhancing the N− polysilicon of the gate region to N+;

depositing cross-over oxide over the field oxide, NMOS transistor being formed, and the PMOS polysilicon active area;

removing the cross-over oxide from the PMOS active area;

growing oxide over the PMOS active area and depositing nitride thereover;

delineating at least a PMOS gate on the polysilicon active area, the removing the oxide and nitride layers except over the PMOS gate;

doping the PMOS drain and source P+ while the gate for the PMOS transistor being formed is shielded by the nitride and oxide layer;

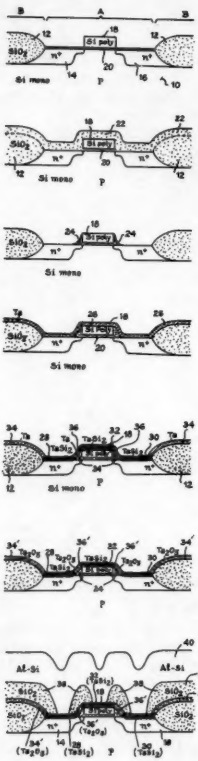
oxidizing the field oxide, source and drain of the PMOS active area where the crossover oxide was removed;

removing the gate nitride and oxide layers to bare polysilicon over the PMOS active area, and growing gate oxide for the PMOS transistor;

opening the source, gate, and drain for the NMOS transistor being formed and the source and drain for the PMOS transistor being formed for contacts; and,

establishing metal contacts for said source, gate, and drain for the NMOS transistor and said source and drain for the PMOS transistor, and establishing a metal electrode for said PMOS gate.

atmosphere, in order to oxidize the tantalum without oxidizing the tantalum silicide;



continuing the manufacturing process without eliminating the remaining tantalum oxide.

4,593,454

PROCESS FOR MANUFACTURING AN INTEGRATED CIRCUIT WITH TANTALUM SILICIDE CONNECTIONS UTILIZING SELF-ALIGNED OXIDATION

Annie Baudrant, St. Martin d'Heres, and Michel Marty, Grenoble, both of France, assignors to Societe pour d'Etude et la Fabrication de Circuits Integres Speciaux EFCS, Grenoble, France

Filed Nov. 20, 1984, Ser. No. 673,425

Claims priority, application France, Nov. 22, 1983, 83 18565

Int. Cl.[4] H01L *21/283, 21/314*

U.S. Cl. 29—571 **9 Claims**

1. Process for manufacturing an integrated circuit comprising the following operations:

forming conventionally on a silicon slice base zones separated by zones where an insulator is present on the surface of the slice;

depositing a layer of tantalum uniformly on the whole of the surface of the slice;

subjecting the slice to a temperature of about 750° C. in the presence of a neutral gas, preferably argon, in dry atmosphere, in order to form thereby tantalum silicide throughout where the tantalum covers directly the silicon and in order to preserve tantalum where it covers the insulator (silicon oxide);

subjecting the slice to a temperature of about 200° C. in the presence of an oxidizing gas, preferably oxygen, in dry

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4,593,455

APPARATUS FOR MAKING PHOTOVOLTAIC MODULES

David A. Dilts, Gates Mills, and Robert A. Hartman, Chagrin Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 655,902, Sep. 28, 1984, Pat. No. 4,567,642. This application Sep. 3, 1985, Ser. No. 771,581

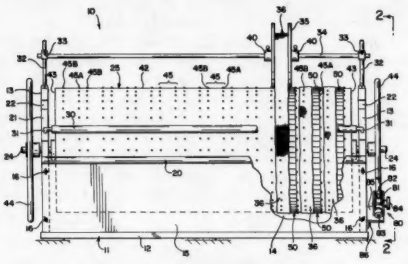
Int. Cl.[4] H01L *31/18*

U.S. Cl. 29—572 **27 Claims**

1. An apparatus for making a photovoltaic module having a plurality of cell strips and electrically conductive interconnects comprising:

means for receiving a plurality of elongated cell strips, said means for receiving having a curved surface;

means to locate the cell strips laterally to each other when received by said curved surface;
means to secure the cell strips to said curved surface; and,



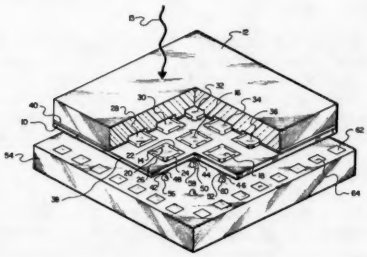
means for positioning the electrically conductive interconnects relative to the cell strips for securement thereto.

4,593,456

PYROELECTRIC THERMAL DETECTOR ARRAY

Derek T. Cheung, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 487,659, Apr. 25, 1983, Pat. No. 4,532,424.
This application Apr. 10, 1985, Ser. No. 721,750
Int. Cl.[4] H01L *35/34, 37/00;* **G01J** *5/10*
U.S. Cl. 29—573 **7 Claims**



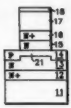
1. A method of making a thermal detector array, comprising the steps of:
providing a layer of pyroelectric material;
providing a support layer;
affixing first surface of the pyroelectric layer to the support layer;
establishing a plurality of openings through the pyroelectric layer to define a detector region in the layer;
repeating a plurality of times the step of establishing a plurality of openings to define a plurality of detector regions in the pyroelectric layer;
providing a substrate;
affixing a first surface of the substrate to a second surface of the pyroelectric layer; and
removing the support layer.

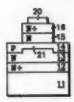
4,593,457

METHOD FOR MAKING GALLIUM ARSENIDE NPN TRANSISTOR WITH SELF-ALIGNED BASE ENHANCEMENT TO EMITTER REGION AND METAL CONTACT

Mark S. Birrittella, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 17, 1984, Ser. No. 682,507
Int. Cl.[4] H01L *21/161, 21/203, 21/263*
U.S. Cl. 29—576 B **9 Claims**





1. A method for fabricating a binary III-V compound, self-aligned transistor device comprising the steps of:
forming a first active layer having a first conductivity type overlying a substrate;
forming a second active layer having a second conductivity type overlying said first active layer;
forming a third active layer having said first conductivity type overlying said second active layer;
forming a first masking layer overlying a portion of the surface of said third active layer;
forming a second masking layer overlying said first masking layer
selectively etching away said third active layer not underlying said first masking layer; and
enhancing said second layer by implanting ions thereinto so that a portion of said first layer assumes a conductivity of said second type, said portion being aligned with but not underlying said first masking layer.

4,593,458

FABRICATION OF INTEGRATED CIRCUIT WITH COMPLEMENTARY, DIELECTRICALLY-ISOLATED, HIGH VOLTAGE SEMICONDUCTOR DEVICES

Michael S. Adler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

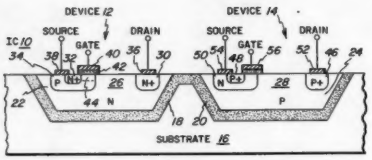
Filed Nov. 2, 1984, Ser. No. 667,933
Int. Cl.[4] H01L *21/76, 21/306, 21/441*
U.S. Cl. 29—576 W **5 Claims**

1. A method of fabricating an integrated circuit including first and second, dielectrically-isolated complementary, high voltage semiconductor devices, the first semiconductor device including a first voltage-supporting region of one conductivity type and the second device including a second voltage-supporting region of opposite conductivity type, said first and second voltage-supporting regions being of the lateral-current conduction type, the method comprising the steps of:
(a) providing a semiconductor wafer including partially-formed first and second insulating tubs in which said first

and second semiconductor devices are to be respectively formed;

(b) epitaxially growing in said first and second insulating tubs, respectively, first and second semiconductor layers, respectively, said epitaxially-grown layers being doped to the one conductivity type with a doping concentration below 20 percent of the final doping concentration of said first device voltage-supporting region;

(c) introducing the opposite conductivity type dopant into said second layer to complete the doping of said second voltage-supporting region, said dopant being limited in amount such that said second voltage-supporting region is



entirely depletable at a rated blocking voltage of the second semiconductor device;

(d) introducing the one conductivity type dopant into said first layer to complete the doping of said first voltage-supporting region, said dopant being limited to such an extent that the first voltage-supporting region is entirely depletable at a rated blocking voltage of said first semiconductor device;

(e) forming respective main current semiconductor regions in said first and second layers; and

(g) forming main current electrodes on said main current semiconductor regions.

4,593,459

MONOLITHIC INTEGRATED CIRCUIT STRUCTURE AND METHOD OF FABRICATION

Paul E. Poppert, Acton; Marvin J. Tabasky, Peabody, and Eugene O. Degenkolb, Wayland, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 28, 1984, Ser. No. 687,409

Int. Cl.[4] H01L *21/76, 21/82*

U.S. Cl. 29—577 C **12 Claims**

6. The method of fabricating monolithic integrated circuit structure incorporating complementary field effect transistors comprising

providing a body of semiconductor material having an underlying layer of one conductivity type and having a first section of one conductivity type and a second section of the opposite conductivity type at a surface of the body, said first and second sections being contiguous at a junction in said body of semiconductor material and said first and second sections each being contiguous with said underlying layer at an interface parallel with said surface;

forming grooves in said first and second sections extending from said surface to below said interface to provide a first isolated sector of said first section encircled by grooves and a second isolated sector of said second section encircled by grooves;

forming a coating of adherent nonconductive protective material on the exposed semiconductor material of said grooves;

filling said grooves with a semiconductor fill material;

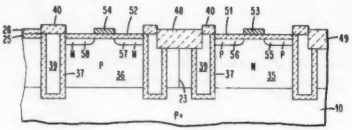
forming a coating of adherent nonconductive protective material on the surface of the semiconductor fill material adjacent to said surface of the body to enclose said semiconductor fill material with nonconductive protective materials;

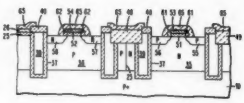
removing semiconductor material from a portion of said first and second sections at said junction to form a trench extending into said body from said surface between said grooves of said first and second sections;

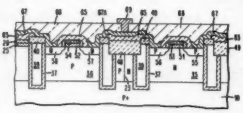
filling said trench with adherent nonconductive protective material;

placing an adherent gate layer of insulating material on the surface of said first and second sectors;

placing a first gate member of semiconductor material of low resistivity over a portion of the gate layer of insulating material overlying a channel region of said first sector with said channel region lying between two source/drain regions of said first sector, and a second gate member of semiconductor material of low resistivity over a portion of the gate layer of insulating material overlying a channel region of said second sector with said channel region lying between two source/drain regions of said second sector;







introducing conductivity type imparting material of the opposite conductivity type into said two source/drain regions of said first sector, and introducing conductivity type imparting material of the one conductivity type into said two source/drain regions of said second sector;

removing insulating material to expose areas of said two source/drain regions of said first sector and areas of said two source/drain regions of said second sector at said surface; and

forming adherent conductive connections in ohmic contact with said areas, one of said connections connecting a source/drain region of said first sector and a source/drain region of said second sector and overlying said nonconductive protective material filling said trench.

4,593,460

METHOD TO ACHIEVE A DESIRED BANDWIDTH AT A GIVEN FREQUENCY IN A DIELECTRIC RESONATOR FILTER

Mark A. Gannon, Schaumburg, and Francis R. Yester, Jr., Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1983, Ser. No. 567,438

Int. Cl.[4] H01P *1/20;* **H01F** *41/00*

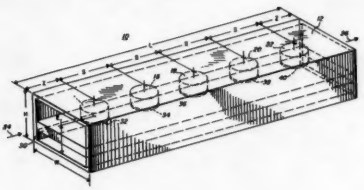
U.S. Cl. 29—602 R **18 Claims**

1. A method for mounting and locating dielectric resonators in a filter comprising the sequential steps of:

spacing dielectric resonators to provide interresonator coupling at the frequency of interest,

then, positioning the elevation of all of the resonators with respect to an electromagnetic field distributed about the resonator to achieve a desired bandwidth,

whereby the longitudinal spacing between dielectric resonators is spaced to provide interresonator coupling over the frequency spectrum of interest, and the desired bandwidth about the center frequency is obtained by altering the elevational position at which the resonators intercept the electromagnetic field.



4,593,461

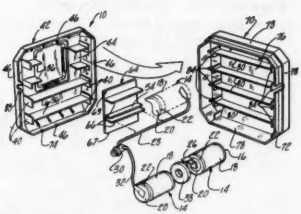
POWER CELL ASSEMBLY

Karl O. Thiele, Bloomfield Hills, and Steven L. Toth, Pontiac, both of Mich., assignors to Enetronics, Inc., Clawson, Mich.

Division of Ser. No. 522,823, Aug. 12, 1983, abandoned. This application Nov. 30, 1984, Ser. No. 676,727

Int. Cl.[4] H01M *6/00, 2/10*

U.S. Cl. 29—623.1 **4 Claims**



1. A method of assembling a power cell casing assembly (10) including a plurality of power cells (14) having a charged first pole (16) and a like charged cylindrical portion (18) and an oppositely charged second pole (20) for operating video equipment (12), the base member (42) including a recessed portion and an insert member (64) defining a portion of two of the partitioning walls (36) and a portion of the floor portion (44) of the base member (42), said method comprising the steps of: disposing the insert member (64) over the recessed portion of the base member (42) to form the first and second partitioning walls (36) and the floor portion (44) therebetween, disposing a plurality of the power cells (14) between the partitioning walls (36) of a base member (42) and adjacent the floor portion (44) thereof; electrically connecting the power cells (14) in series within the base member (42); applying a liquid adhesive (82) over the floor portion (44) between the first and second partitioning walls (36) and enclosing the connected power cells (14) to provide external insulation between the connected power cells (14) and the external environment.

4,593,462

APPARATUS FOR AUTOMATICALLY MOUNTING CHIP-TYPE CIRCUIT ELEMENTS ON SUBSTRATE

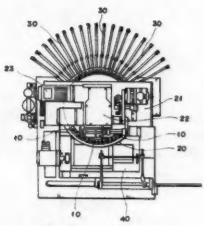
Hiroshi Yagi; Hisashi Fujita, and Kotaro Harigane, all of Nihonbashi, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 751,034

Claims priority, application Japan, Sep. 24, 1984, 59-199309; Feb. 19, 1985, 60-32481; Feb. 19, 1985, 60-32482; Feb. 19, 1985, 60-32483; Feb. 19, 1985, 60-32484; Feb. 19, 1985, 60-32485

Int. Cl.[4] H05K *3/00, 1/00, 3/30*

U.S. Cl. 29—740 **9 Claims**



1. An automatic mounting apparatus comprising:

a rotating disk;

a plurality of mounting heads arranged on the surface of said rotating disk at regular intervals to downward direct nozzle tips thereof;

a plurality of tape feeders for feeding chip tapes which hold chip-type circuit elements thereon, said tape feeders being radially arranged toward the axis of rotation of said rotating disk below the passage of movement of said mounting heads;

an X-Y table for carrying thereon a substrate on which the circuit elements are to be mounted, said X-Y table being arranged opposite to said tape feeders;

said mounting heads successively sucking up chip-type circuit elements from said chip tapes and mount said circuit elements on said substrate with the rotation of said rotating disk; and

detecting means for detecting a defect of the circuit element such as a failure in suction of a circuit element by the mounting head, the wrong posture of a circuit element sucked up on the mounting head or the like;

said rotating disk being controllably actuated to allow the mounting head other than the mounting head relating to said defect to suck up a circuit element of the same kind from said tape feeders and mount it on said substrate after said detecting means detects said defect.

4,593,463

METHOD OF MAKING A CONTACT ASSEMBLY

Takashi Kamono, Yokohama, and Akihiko Otsu, Kawasaki, both of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 11, 1984, Ser. No. 659,609

Claims priority, application Japan, Oct. 31, 1983, 58-204616

Int. Cl.[4] H01R *43/16*

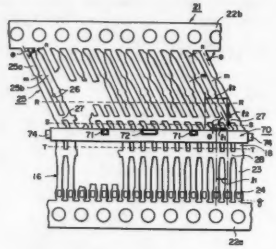
U.S. Cl. 29—884 **2 Claims**

1. A method of making a contact assembly comprising the steps of:

stamping and forming a lead frame of electrical contact members from a blank strip of metal having contact portions, intermediate portions and terminal portions, the contact portions extending outwardly from a first carrier strip in a normal direction thereto and the terminal portions extending outwardly from a second carrier strip at an angle thereto;

molding a dielectric member to said intermediate portions;

cutting the contact portions and the terminal portions from the carrier strips; and



bending the contact portions at a substantially right angle in one direction and bending the terminal portions at a right angle in a direction opposite to the one direction.

4,593,464

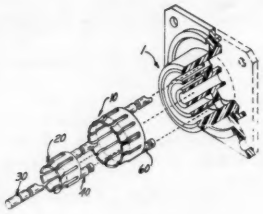
METHOD OF MAKING A TRIAXIAL ELECTRICAL CONNECTOR

Robert L. Williams, Bainbridge, and Christopher Marks, Guilford, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Division of Ser. No. 523,481, Aug. 15, 1983, Pat. No. 4,519,666. This application Oct. 29, 1984, Ser. No. 665,473

Int. Cl.[4] H01R *43/02*

U.S. Cl. 29—879 **4 Claims**



1. A method of electrically and mechanically connecting an electrically conductive terminal having an annular groove to a tubular electrical conductor including a radially extending lip having a notch therein comprising the steps:

placing the annular groove of the terminal into the notch of the tubular conductor so that upper and lower walls of the groove confront, respectively, the top and bottom surfaces of the lip adjacent to the notch;

plastically deforming the terminal locally of the groove and about the notch until the lip is captivated by the deformed walls of the groove thereby mechanically connecting the terminal to the lip of the conductor; and

applying solder around the mechanical connection between said terminal and the lip of said tubular conductor.

4,593,465

ROTARY NIBBLER

Brian A. Bennett, 53 Morphett Rd., Camden Park, State of South Australia, Australia

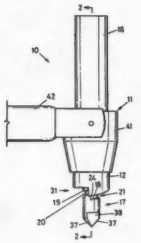
Filed Nov. 7, 1984, Ser. No. 669,454

Claims priority, application Australia, Nov. 9, 1983, PG2308

Int. Cl.[4] B23D *27/02*

U.S. Cl. 30—240 **13 Claims**

1. A rotary nibbler comprising a body, a bearing sleeve in the body having a bearing surface, a spindle carried in said bearing sleeve for rotation within the body about a central axis, a first end of the spindle having a drive engagement surface adjacent one end of the body, a second end of the spindle projecting from the other end of the body and having surfaces defining a helical groove in the side wall of the spindle, one of said groove surfaces defining, with that side wall, a helical cutting edge,



the bearing sleeve also having a flat workpiece engagement face which defines, with the axis of rotation, an angle which approximates the helix angle of the groove, the bearing sleeve having a curved surface contiguous with said spindle side wall and opening to the workpiece engagement face, defining therewith a cutting edge fixed with respect to the body and co-operable with said helical cutting edge upon rotation of the spindle.

4,593,466

ELECTRIC KNIFE

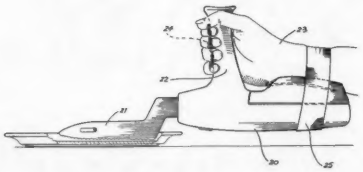
William J. O'Brien, 45 Murray Street, Pyrmont, New South Wales, Australia

Filed Oct. 30, 1984, Ser. No. 667,111

Claims priority, application Australia, Nov. 10, 1983, PG2331

Int. Cl.[4] B26B *7/00*

U.S. Cl. 30—272 A **3 Claims**



1. An electric knife, comprising:

an elongated handle housing a driving motor,

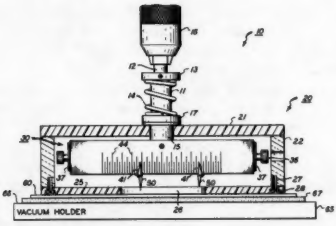
a pair of blades projecting in an axial direction, from a forward end of said handle and being coupled to said driving motor for reciprocable motion relative to one another,

each blade including a first straight portion supported in said handle one end, a second straight portion disposed forwardly of said first portion, and a third portion interconnecting the forward end of said first portion with the rearward end of said second portion, said second portion having a cutting edge and being parallel to, and spaced from, said first portion, said cutting edge being disposed below said handle,

said first, second and third portions all having about the same width, and

each blade being formed as a single piece.

4,593,467
CIRCULAR CUTTER
Tibor Safar, 95 Thorndyke Rd., Rochester, N.Y. 14617
Filed Apr. 19, 1985, Ser. No. 725,104
Int. Cl.[4] B26B *3/08*
U.S. Cl. 30—300 **24 Claims**



1. A work piece holder and guard for a circular cutter having a rotary beam bearing a downwardly extending cutting knife, said beam being mounted transversely on a shaft attachable to a rotary chuck that can move axially to advance and retract said cutter relative to a work piece and can rotate said cutter relative to said work piece for making a circular cut, said work piece holder and guard comprising:

a. a transparent guard drum having a generally cylindrical wall surrounding and enclosing the rotational path of said beam;

b. said drum having a transparent top rotatably mounted on said shaft above said beam and enclosing a region between said shaft and an upper region of said cylindrical wall;

c. a transparent, annular pressure shoe removably secured to a lower region of said cylindrical wall and extending below said beam in a plane parallel with said work piece radially inward from said cylindrical wall to a central opening in said pressure shoe through which said cutting knife can advance; and

d. a spring axially biasing said drum downward on said shaft relative to said beam so that said drum and said pressure shoe move up and down with said chuck and said beam throughout a region wherein said pressure shoe moves clear of said work piece, and said spring is compressed throughout a region of axial movement of said chuck and said beam wherein said pressure shoe engages and holds said work piece in place and said cutting knife advances into cutting engagement with said work piece while guarded by said drum.

4,593,468
CONVERTIBLE NOTE PAD AND PENCIL SHARPENER
Robert R. Vincent, 2256 S. Dollsion, Springfield, Mo. 65807
Filed Oct. 29, 1984, Ser. No. 666,114
Int. Cl.[4] B43L *23/00*
U.S. Cl. 30—451 **8 Claims**

1. Apparatus presenting a combined pencil sharpener and note pad comprising:

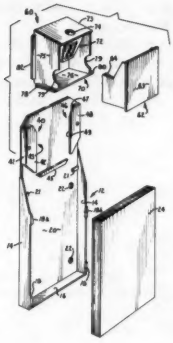
a housing presenting a compartment for said note pad;

means on said first housing for maintaining said note pad within said compartment;

a sharpener assembly;

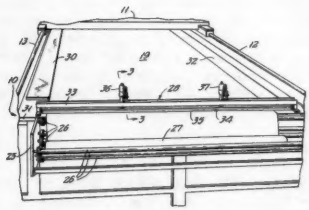
first and second fastener means on said pencil sharpener; and

third fastener means on said housing presenting structure for a releasable, complementary engagement with either said first or second fastener means on said sharpener assembly, said respective engagements positioning said sharpener



assembly in either first and second positions relative to said housing and said note pad maintained therein.

4,593,469
LARGE SCALE X-Y PLOTTING TABLE
Walter C. Shoup, II, Wyckoff, N.J., assignor to Autographic Business Forms, Inc., Mahwah, N.J.
Filed May 6, 1985, Ser. No. 730,937
Int. Cl.[4] B65H *17/36*
U.S. Cl. 33—1 M **7 Claims**

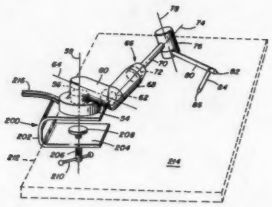


1. A large scale X-Y plotting table for handling elongated pliable sheet material that exceeds lengthwise the plotting range of the table and requires longitudinal indexing across the table between successive plots thereon for receiving in edge-to-edge registration successive adjacent contiguous plotting fields, comprising in combination a table structure for receiving said sheet material thereon, said structure having opposite side edges beyond which said material extends when placed in plot receiving position on said table, a plotting instrument mounted over said table for X-Y coordinate controlled motion, a clamp bar mounted on said table parallel and adjacent each of said side edges, said clamp bar having a length parallel to said side edges that exceeds the dimension of the widest sheet material to be used with said table, each said clamp bar being mounted for independently selective movement toward and away from the sheet material supporting surface of said table structure for selectively clamping said sheet material against said table structure, and operator controllable actuator means operatively coupled to each of said clamp bars for providing operator selectable actuation of each of said clamp bars into either clamping or releasing condition.

4,593,470
PORTABLE THREE DIMENSIONAL GRAPHICS TABLET

David L. Davies, Glastonbury, Conn., assignor to Micro Control Systems, Inc., Vernon, Conn.

Continuation-in-part of Ser. No. 397,976, Jul. 14, 1982, Pat. No. 4,477,973. This application Aug. 13, 1984, Ser. No. 640,443
The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.
Int. Cl.[4] G01B 7/03
U.S. Cl. 33—1 CC 4 Claims



1. Portable three-dimensional coordinate resolving apparatus for attachment to an existing surface comprising:

a mounting element including clamping means for attachment to said surface;

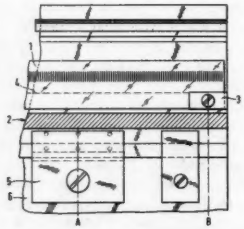
a contacting tip element; and

an articulated arm assembly connecting said contacting tip element to said mounting element, said arm assembly comprising a first link element rotatably connected to said mounting element for rotation about a first axis, a second link element rotatably connected to said first link element for rotation about a second axis, said second link element having two sections interconnected for relative rotation about a third axis, and a third link element rotatably connected to said second link element for rotation about a fourth axis, and further including first, second, third and fourth potentiometers for measuring the angles of rotation about the first, second, third and fourth axes respectively and for producing electrical signals responsive to said rotations, whereby said signals collectively determine the coordinates of said tip element.

4,593,471
ENCAPSULATED MEASURING SYSTEM

Guenther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,476
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 8304009[U]
Int. Cl.[4] G01B 11/04
U.S. Cl. 33—125 T 7 Claims



1. In an encapsulated measuring arrangement for measuring the relative position of two objects, said measuring arrangement comprising a housing, a measuring scale disposed within the housing, and a scanning unit adapted to scan the scale and mounted to one of the two objects, the improvement comprising:

first means for securing the housing to the other of the two objects at a first fastening point; and

second means for securing the scale to the housing at a second fastening point such that the scale is slightly movable in a measuring direction defined by the scale with respect to the housing at points spaced from the second fastening point;

thermal expansion of said other of the two objects operating to shift the first fastening point in a first direction aligned with the measuring direction by a predetermined distance per unit increase in temperature;

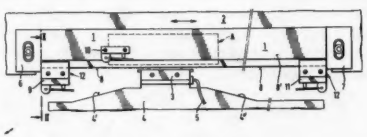
the separation of the first and second fastening points along the measuring direction being selected such that thermal expansion of the portion of the housing between the first and second fastening points shifts the second fastening point in a second direction, aligned with the measuring direction and opposed to the first direction, by said predetermined distance per unit increase in temperature;

thermal expansion and contraction of the portion of the housing between the first and second fastening points thereby shifting the position of the scale in the measuring direction with respect to the other of the two objects by an amount selected to compensate for and counteract thermal expansion and contraction of the other of the two objects.

4,593,472
LENGTH OR ANGLE MEASURING INSTRUMENT

Eckhard Berner, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Aug. 14, 1984, Ser. No. 640,779
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334609
Int. Cl.[4] G01B 11/04
U.S. Cl. 33—125 C 9 Claims



1. In a position measuring instrument for measuring the relative position of first and second portions of a machine movable relatively to one another, of the type comprising a measuring scale or graduation carrier adapted to be mounted to the first portion of the machine, and a scanning unit adapted to be mounted to the second portion of the machine, the improvement comprising:

at least one limit position switch adapted to control the machine to limit relative movement of the first and second portions of the machine;

at least one cam adapted to switch the limit position switch;

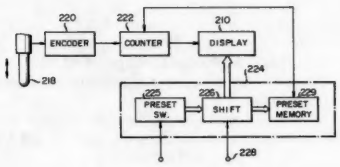
means for arranging one of the switch and the cam on the carrier to move with the first portion of the machine; and

means for arranging the other of the switch and the cam to move with the second portion of the machine such that the cam and switch are aligned to cause the cam to actuate the switch at a selected relative position between the first and second portions of the machine.

4,593,473
DIGITAL DISPLAY MEASURING APPARATUS

Toshitaka Shimomura, Kanagawa, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

PCT No. PCT/JP84/00092, § 371 Date Sep. 7, 1984, § 102(e) Date Sep. 7, 1984, PCT Pub. No. WO84/03559, PCT Pub. Date Sep. 13, 1984
Continuation of Ser. No. 653,250, Sep. 7, 1984, abandoned. This PCT application Mar. 8, 1984, Ser. No. 794,972
Claims priority, application Japan, Mar. 9, 1983, 58-38763; Mar. 17, 1983, 58-45005; Mar. 31, 1983, 58-56433
Int. Cl.[4] G01B 7/28
U.S. Cl. 33—169 R 5 Claims

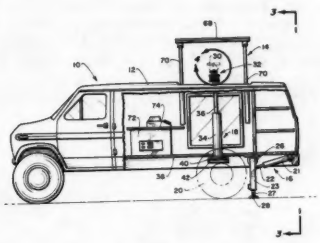


1. A digital display measuring apparatus including:
a probe which is movably installed to the body and brought in contact with the object to be measured;
an encoder which converts a displacing amount of said probe into electric signal pulse to output therefrom;
a presetting device which establishes as a preset value the measuring standard value in accordance with the object to be measured;
a counter which counts said preset value and said electric signal pulse; and
a digital display unit which displays in digital representation the measured value of the object in accordance with the counted value;
wherein said presetting device comprises:
a preset switch which is operated for the establishment of preset value, said preset switch comprises:
a preset value display circuit which calls to display the preset value in the preset memory on the digital display unit by the call touch operation of said preset switch;
a cursor display circuit which displays a cursor at any display digit of said digital display unit and moves the cursor display digit one after another by means of the continuous touch operation of the present switch for a certain time for the movement of the cursor;
a convertor which advances and converts the cursor display digit of the displayed preset value on the digital display unit by means of the advance touch operation of the preset switch; and
an establishing circuit which establishes as the new preset value the preset value after the conversion by means of the establishing touch operation of the preset switch after the completion of a series of conveting operation of the preset value displayed on the digital display unit; and
a preset memory in which an optional numerical value displayed on the digital display unit is established as the preset value by the operation of said preset switch;
whereby the preset value corresponding to the object to be measured can be established by a series of combined operation in accordance with the predetermined time sequence of the preset switch.

4,593,474
SURVEY VEHICLE

Thomas C. Mayhew, 1233 Vienna Way, West Wing, Marina del Rey, Calif. 90291

Filed Nov. 5, 1984, Ser. No. 668,479
Int. Cl.[4] G01C 5/00, 15/00
U.S. Cl. 33—264 7 Claims

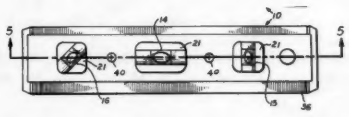


1. Mobile apparatus for land surveying comprising a vehicle adapted to convert to a stabilized observation platform including:
(a) retractable means for stabilizing said vehicle during observation; and
(b) means for observing topographic features comprising:
(1) surveying instrumentation supported by a plate mounted on gimbaled apparatus supported by an extensible means located in the interior of said vehicle, which, when extended, permits observation by said surveying instrumentation, and
(2) means for raising a portion of the roof of said vehicle to accommodate said surveying instrumentation during observation.

4,593,475
LEVEL WITH SLOTTED MAGNET SUPPORT

Daniel J. Mayes, Johnson City, Tenn., assignor to Great Neck Saw Manufacturing, Inc., Mineola, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,455
Int. Cl.[4] G01C 9/28
U.S. Cl. 33—347 2 Claims



1. A level comprising a body,
said body comprising two spaced flanges,
a web member integrally attached to said flanges holding said flanges in spaced relation,
said web member having at least one opening therein,
a vial received in said opening,
said first flange being fixed to a first side of said web,
said second flange being fixed to a second side of said web,
said first flange having a recess therein extending from one end of the body to the other,
a rubber magnet received in said recess and a working surface on said rubber magnet parallel to the longitudinal axis of said level vial and extending from one end of said flange to the other,
a longitudinal groove in said rubber magnet extending from said one end thereof to the other and adapted to receive a part of an iron pipe or the corner of two magnetic members disposed at an angle to each other to be leveled or plumbed whereby said level is held in alignment with said pipe, whereby said magnet continuously exerts a magnetic

force over the part of said pipe or the part of said corner member that is engaged by said magnetic rubber and is adapted to hold said level in alignment with said pipe.

4,593,476

COMPUTER AIDED ADJUSTABLE TUBE CHECKING FIXTURE SYSTEM

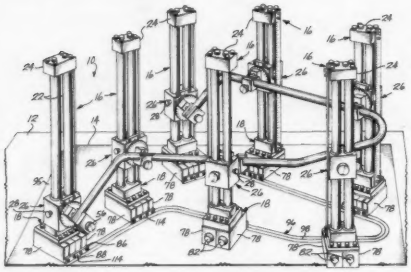
Kevin E. Clark, Kirkland, and Richard P. Jones, Everett, both of Wash., assignors to The Boeing Company, Seattle, Wash.

PCT No. PCT/US83/01354, § 371 Date Sep. 6, 1983, § 102(e) Date Sep. 6, 1983, PCT Pub. No. WO85/01102, PCT Pub. Date Mar. 14, 1985

PCT Filed Sep. 6, 1982, Ser. No. 747,327

Int. Cl.⁴ G01B *5/20*

U.S. Cl. 33—529 **14 Claims**



1. A system for checking shaped tubing comprising: a film having an inscribed plan view of a formed tube to be checked; a series of adjustable holding fixtures to be positioned on a flat metallic surface holding the inscribed film and each holding fixture having means for alignment with respect to the inscribed line, means for vertical and for angle adjustment for holding a section of formed tubing, and means for locking, each positioned fixture in place on the metallic surface.

4,593,477

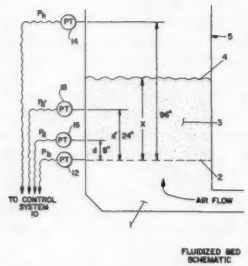
CONTROL SYSTEM FOR A FLUIDIZED BED

Donald J. Dziubakowski, Seven Hills, and John W. Smith, Massillon, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 450,508, Dec. 16, 1982, abandoned. This application Jan. 14, 1985, Ser. No. 691,339

Int. Cl.⁴ F26B *3/08*

U.S. Cl. 34—10 **14 Claims**



FLUIDIZED BED SCHEMATIC

1. A system for sensing and controlling the bed level of a fluidized bed comprising:

first pressure sensing means for sensing pressure (P_b) substantially at the bottom of said fluidized bed and establishing a signal indicative thereof;

second pressure sensing means for sensing pressure (P_b) above the top surface of said fluidized bed and establishing a signal indicative thereof;

third pressure sensing means for sensing pressure (P_d) between said first and second pressure sensing means so as to be within said fluidized bed and establishing a signal indicative thereof; and

means for establishing a control signal directly proportional to the difference ($P_b - P_h$) between said signal indicative of the pressure (P_b) substantially at the bottom of said fluidized bed and said signal indicative of the pressure (P_h) above the top surface of said fluidized bed and inversely proportional to said signal indicative of the pressure (P_d) between said first and second pressure sensing means for controlling an optimized bed level.

4,593,478

PRESSURE-REDUCING VALVE

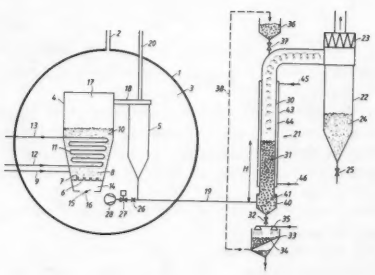
Gunnar Stendahl, Västerås, Sweden, assignor to AB Asea-Atom, Västerås, Sweden

Filed Apr. 13, 1984, Ser. No. 600,024

Claims priority, application Sweden, Apr. 15, 1983, 8302105

Int. Cl.⁴ F26B *17/00*

U.S. Cl. 34—57 R **12 Claims**



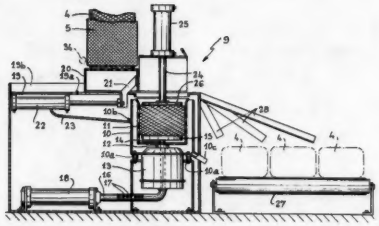
1. In a pressurized fluidized bed combustion power plant which includes a combustion chamber in which fuel is burned to produce combustion gases and particulate material, said particulate material being contained in said combustion gases; a cyclone separator in which said particulate material is recovered from said combustion gases, said combustion chamber and said cyclone separator being operated at a first pressure; a collection container for collecting said particulate material, said collection container being operated at a second pressure which is lower than said first pressure; a delivery line for conveying said particulate material from said cyclone separator to said collection container, said particulate material moving through said delivery line by a transport fluid, and a valve means in said delivery line, the improvement wherein said valve means comprises a vertical housing connected in said delivery line such that said particulate material and transport fluid will move continuously upwardly therethrough, said vertical housing having a lower part and an upper part and containing a bed of fluidizable particles, the upward flow of said particulate material and transport fluid through said vertical housing causing said bed of fluidizable particles to become fluidized such that said particulate material and transport fluid will be discharged from the upper part of said vertical housing at said second pressure, said fluidizable particles having a sufficiently greater velocity of fall than the velocity of fall of said particulate material, such that said fluidizable particles will not be discharged from the upper end of said vertical housing.

4,593,479

AUTOMATIC MACHINE WITH MULTIPLE STATIONS FOR DRYING TEXTILE PACKAGES

Maurice Pignal, 13 Petit Chemin de la Muette, 07200 Annonay; Max Tridon, 67 Rue Bataille, 69008 Lyon, and Michel Martin, 58 rue Victor Hugo, 69002 Lyon, all of France

Filed Jul. 20, 1984, Ser. No. 632,932
Int. Cl.[4] F26B *11/08*
U.S. Cl. 34—58 4 Claims



1. A machine having multiple centrifuge units for receiving and drying individual wet packages of yarn coming from a dyeing operation, the machine comprising at each centrifugal unit:

(a) a wet package supporting table;

(b) a fixed centrifuge vat extending below the table and having an open upper end terminating adjacent to the table;

(c) a rotatable centrifuge basket in the vat and shaped to receive a yarn package and maintain its shape during centrifuging;

(d) a motor located below the basket and having a hollow shaft axially supporting the basket for rotation by the motor;

(e) an elevator plate located within the basket to support a package during centrifuging, the plate being supported by a push element extending axially downwardly therefrom into the hollow motor shaft;

(f) push means below the motor and operative in the hollow shaft to contact the push element to raise the elevator plate to the level of the table when centrifuging of a package is completed and to lower the elevator plate into the basket when supporting a wet package to be centrifuged; and

(g) slide means on the supporting table and operative to push a wet package onto the elevator plate when raised, and thereby displace a centrifuged package therefrom.

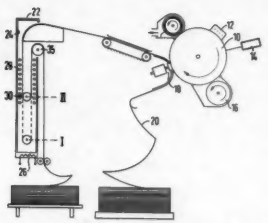
4,593,480

PAPER DEFLECTION ROLLER FOR A PRINTER OR COPIER MEANS FUNCTIONING ON THE PRINCIPLE OF ELECTROPHOTOGRAPHY

Eduard Mair, and Siegfried Zoeke, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 23, 1984, Ser. No. 573,000
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1983, 3304068
Int. Cl.[4] F26B *13/14*
U.S. Cl. 34—78 9 Claims

1. A deflection roller for guiding a recording medium applied with toner through a printing device fixing station housing containing solvent vapor and having a cooling coil means disposed adjacent an upper end of said housing and a heater for evaporating liquid solvent into vapor adjacent a lower end of said housing, comprising a cylindrical roller body made of lightweight plastic material on which is a grid-network mesh structure, in the form of an individual synthetic fabric sleeve fitted over said roller body, providing narrow raised lines enclosing open area depressions bottomed by the exterior surface of said roller body such that said recording medium is supported on said raised lines at a free space distance away from said roller body, such that said deflection roller means has



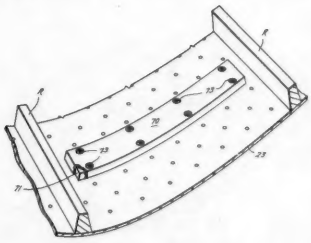
low mass, a low mass moment of inertia, and very low thermal conductivity for high speed operation while avoiding solvent vapor dewing on said deflection roller means.

4,593,481

TUMBLE DRYER

Norvin L. Pellerin, New Orleans, La., assignor to Pellerin Milnor Corporation, Kenner, La.

Filed Mar. 7, 1985, Ser. No. 709,224
Int. Cl.[4] F26B *11/04*
U.S. Cl. 34—133 6 Claims



1. A tumble dryer, comprising a drum to receive cloth goods to be dried and mounted for rotation about a generally horizontal axis, said drum having a cylindrical surface which is perforated on opposite sides of an annular imperforate portion, means for circulating heated air through the goods including means for causing the air to pass radially into the drum through perforations on one side of the imperforate portion, axially within the drum, and then radially out of the drum through perforations on the other side of the imperforate portion, and a heat sink on which melted plastic articles in a batch of the goods may be collected, comprising relatively thin strips removably secured to the inner surface of the annular portion, each strip including a metal body of high thermal capacity and heat conductivity as compared with the material from which the annular portion is made.

4,593,482

MODULAR SUBSTRATE SOLE FOR FOOTWEAR

Hubert Mayer, Marly, Switzerland, assignor to Bata Schuh AG, Mohlin, Switzerland

Filed Jul. 30, 1984, Ser. No. 635,939
Claims priority, application Switzerland, Sep. 29, 1983, 5290/83
Int. Cl.[4] A43B *3/10*
U.S. Cl. 36—7.5 8 Claims

1. A footwear sole structure comprising

a plurality of elongated modular elements of the same material; and

a plurality of intermediate joint members of the same material as said elements fixedly attached between and interconnecting said modular elements in generally parallel,

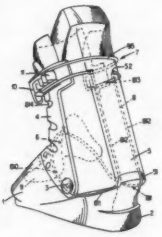
side-by-side relationship in a single layer, the layer thus formed being adapted to constitute the entire sole structure between a foot and a supporting surface.

4,593,483

TIGHTENING AND CLOSURE APPARATUS FOR SKI BOOT

Jean Paris, Sevrier, France, assignor to Salomon S.A., Annecy, France

Filed Nov. 28, 1983, Ser. No. 555,555
Claims priority, application France, Dec. 2, 1982, 82 20887; Oct. 12, 1983, 83 16589
Int. Cl.[4] A43B *5/04, 11/00*
U.S. Cl. 36—119 **37 Claims**



1. A rear entry ski boot comprising:

(a) an upper comprising a cuff and a rear spoiler, at least a portion of said upper being journalled on a shell base along a generally transverse axis;

(b) a foot retention apparatus positioned and configured to directly exert pressure on the foot within said shell base; and

(c) a closure apparatus for closing the upper around the lower leg of the skier, said closure apparatus being connected to the foot retention apparatus by means of a traction circuit.

4,593,484

METHOD OF DREDGING WITH A PIVOTALLY MOUNTED CUTTER HEAD

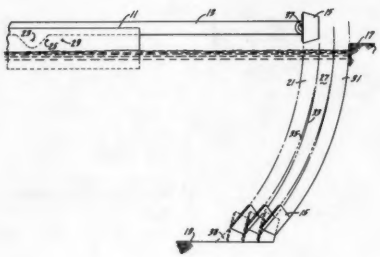
Norman P. Proehl, 373 E. Westminster Ave., Lake Forest, Ill. 60045

Filed Feb. 14, 1985, Ser. No. 701,774
Int. Cl.[4] E02F *3/92*
U.S. Cl. 37—195 **1 Claim**

1. A method of hydraulic dredging to a smooth level bottom using a ladder having a rotating frusto-conical cutter head pivotally mounted on the end of the ladder in which the cutter head has blades which converge relative to the axis of rotation of the cutter head from the trailing edges to the leading edges thereof, including the steps of:

positioning the pivotal connection between the ladder and the cutter head immediately rearwardly of the trailing edges of the cutter head cutting blades,

swinging the rotating cutter head in a series of arcs to the material to be dredged, starting at the top of the material and working downwardly towards the bottom of the material with the cutter head oriented on the ladder so that the axis of rotation of the cutter head is generally aligned coaxially with the longitudinal axis of the ladder, and



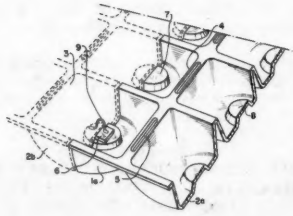
tilting the cutter head relative to the longitudinal axis of the ladder until the cutter blades positioned at the bottom of the cutter head are parallel to the level bottom to be cut with this adjustment taking place after completion of digging of the cutting arc above the last cutting arc needed to dig to the required depth and before the cutter head is swung through said last cutting arc.

4,593,485

DISPLAY PANEL HAVING SEMICONDUCTORS CRYSTALS

Jacques C. Thillays, Herouville St. Clair, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 30, 1984, Ser. No. 615,420
Claims priority, application France, May 30, 1983, 83 08921
Int. Cl.[4] G09F *3/04*
U.S. Cl. 40—452 **8 Claims**



1. A display panel comprising a plurality of semiconductor crystals, each crystal having at least two regions of opposite conductivity forming an electroluminescent junction, said crystals being situated at the bottoms of cavities for reflecting light emitted by said crystals during operation of the display panel, said cavities being formed in strips of material and being disposed according to a previously chosen configuration, and each cavity having at least two metallic connection pads made respectively to contact the two regions of the semiconductor crystal situated at the bottom, characterized in that each of the strips comprises a first and a second row of half-shells disposed in a back-to-back arrangement and producing complementary cavity portions, the half-shells of the first row comprising, at their bottoms, supports and the first connection pads for the semiconductor crystals, and the half-shells of the second row comprising, at their bottoms, metallic contact pads constituting

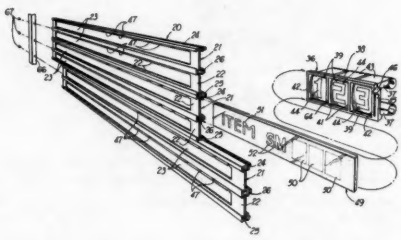
the second connections for said crystals, and in that at least two identical strips are insulated from each other by an insulation material, the two identical strips being associated such that the identical strips form a series of cavities.

4,593,486

MENU AND PRICES DISPLAY DEVICE

Joseph E. Visocky, Sharps Chapel, and Charles F. Ramsay, Knoxville, both of Tenn., assignors to Plasti-Line, Inc., Knoxville, Tenn.

Filed Dec. 27, 1984, Ser. No. 686,915
Int. Cl.[4] G09F *11/00*
U.S. Cl. 40—490 3 Claims



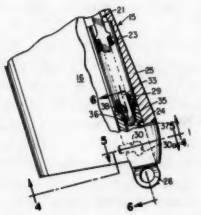
1. A display device comprising a mounting trackway having viewing window openings and at least a pair of spaced opposing parallel trackway grooves, said mounting trackway also having spaced locator notches at intervals along said grooves, a changeable indicia module defining pathways for precoiled indicia tapes, said indicia module having opposite side portions engaging guidably and movably in said grooves of the mounting trackway, and a spring arm attached to the changeable indicia module at one end thereof and including a locking head which project somewhat forwardly of said portions when the spring arm is in a relaxed state, whereby said locking head may engage automatically and releasably in one of said locator notches to position the indicia module at a selected precise location along the mounting trackway.

4,593,487

LATCH ARRANGEMENT FOR PISTOL SPRING STRUT

William B. Ruger, Croydon, N.H., and Roy L. Melcher, Stratford, Conn., assignors to Sturm, Ruger & Company, Inc., Southport, Conn.

Filed Mar. 27, 1985, Ser. No. 716,731
Int. Cl.[4] F41C *27/00, 25/06*
U.S. Cl. 42—7 4 Claims



1. In a handgun having a grip frame, a magazine, a hammer, a strut, a spring urging the strut upwardly against the hammer, the improvement comprising

(a) a cavity in the grip frame adjacent the magazine;

(b) a lanyard loop/mainspring housing positioned in the frame cavity, said loop housing including a housing recess therein;

(c) a strut extension telescopically positioned in the loop housing recess;

(d) spring means mounted between the strut extension and lanyard loop housing to urge the strut extension and housing apart;

(e) rotatable locking means for locking the loop housing to the frame, said locking means being rotated to a first position for locking and, for unlocking the housing from the frame, said locking means being turned to a second position; and

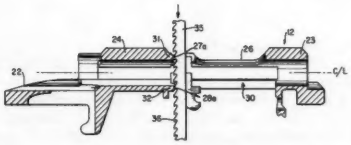
(f) connector means for connecting the lanyard housing and strut extension together when the locking means is in its said second position.

4,593,488

RECEIVER FOR BOLT ACTION FIREARM AND METHOD OF MANUFACTURE

William B. Ruger, Croydon, N.H., assignor to Sturm, Ruger & Company, Inc., Southport, Conn.

Continuation of Ser. No. 694,873, Jan. 25, 1985, abandoned. This application Sep. 8, 1985, Ser. No. 772,207
Int. Cl.[4] F41C *11/00*
U.S. Cl. 42—75 C 3 Claims



2. A method of manufacture of a receiver including the steps of:

(a) forming a metal receiver blank having a rearward portion with a breech opening adjacent thereto; and

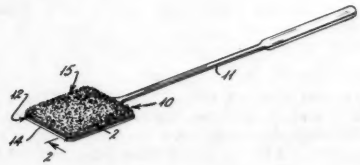
(b) passing a broach means through the breech opening to remove metal from the rearward portion to form at least two spaced-apart bolt lug seats thereon.

4,593,489

INSECT SWATTER

Mary L. Gott, and Robert E. Broadley, both of 388 E. Orange Rd., both of Westerville, Ohio 43081

Filed Aug. 26, 1985, Ser. No. 769,050
Int. Cl.[4] A01M *3/02*
U.S. Cl. 43—137 6 Claims



1. An insect swatting apparatus comprising a body portion which is carried by a handle portion, said body portion being relatively flexible and having upper and lower sides, a plurality of generally J-shaped and flexible filament projections extending outwardly from at least one of said upper and lower sides of said body portion, each of said projections having an outwardly extending base portion end portion and intermediate outermost portion, said outermost portions being substantially uniformly curved so as to be blunt with each of said end portions extending arcuately outwardly and retaining an angle with respect to the axis of said base portion, said projections being in closely spaced relationship with respect to one an-

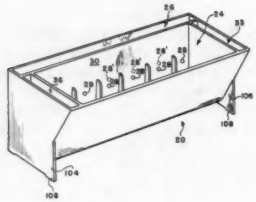
other whereby said projections will engage with portions of an insect being swatted to retain the insect adjacent to said body portion until the insect is selectively disengaged therefrom.

4,593,490

PLANTERS

Paul D. Bodine, Old Greenwich, Conn., assignor to S. B. Green Partnership, Old Greenwich, Conn.

Filed Oct. 5, 1984, Ser. No. 658,178
Int. Cl.[4] A01G *25/00*
U.S. Cl. 47—79 **15 Claims**



1. A planter comprising:

an open topped elongated plant chamber having a bottom, with a front wall, a back wall and two side walls depending from said bottom and extending generally upwardly therefrom with the top edges thereof at substantially the same height, said plant chamber being adapted to contain a planting medium;

an open topped watering chamber affixed to said back of said plant chamber and extending along said back between said two ends, said watering chamber extending from the top edge of said back wall of said plant chamber downwardly for a distance less than the full height of said back wall and having a bottom midway of the height of said back wall, channel means extending from adjacent the bottom of said watering chamber through said back wall, thereby enabling water introduced in said watering chamber to flow into said plant chamber within a planting medium contained in said plant chamber; and

a drainage chamber affixed to each of said two side walls of said plant chamber, said drainage chambers extending for substantially the full height of said side walls and communicating with said plant chamber by way of openings extending through said side walls adjacent said bottom of said plant chamber, said drainage chambers being open topped to enable viewing of the level of water therein;

said bottom of said plant chamber being sloped from the center thereof downwardly toward each of said side walls.

4,593,491

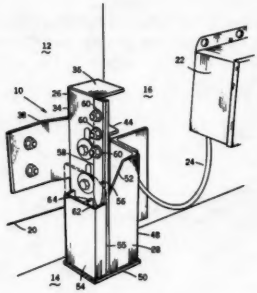
ALARM SENSOR APPARATUS FOR CLOSURES

James A. Carlson, Thornton, and Lawrence M. Stoddard, Arvada, both of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 31, 1984, Ser. No. 575,599
Int. Cl.[4] G08B *13/08*
U.S. Cl. 49—13 **4 Claims**

1. An alarm sensor apparatus for closures having a door facing and a door member which is moveable with respect to the facing, the sensor apparatus comprising:

a pair of cooperating bracket members, one attached to the facing and the other to the door member, two magnetic sensor elements, one supported by each bracket member, one bracket member comprising a pair of guide plates lying in orthogonal planes relative to each other and parallel to the direction of the movement of the door member, the other bracket member including, a pair of complementary guide slots orthogonal to each other for receiving said guide plates therein upon closure of the door member for aligning the sensors with respect the said two orthogonal planes, and a stop member carried by one



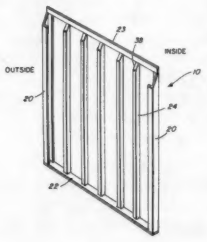
of the bracket members and engageable with the sensor carried by the other bracket member for aligning the sensors in a third orthogonal plane upon closure of the door member.

4,593,492

REMOVABLE WINDOW SECURITY GUARD

Peter Lumenello, c/o Thompson, Birch, Gauthier & Samuels, 225 Franklin St., Boston, Mass. 02110

Filed Aug. 28, 1984, Ser. No. 644,937
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—57 **3 Claims**



1. A window security guard to prevent entry through a window from the outside and mountable within a window frame having a double sash structure with side jambs, interior upper and lower window sashes and an external screen, comprising:

(a) upper and lower horizontal frame bars;

(b) left and right vertical channel members permanently affixed at each of their ends to said horizontal frames to form a substantially rectangular structure;

(c) a plurality of vertical guard bars, both ends of each of said bars permanently affixed to said horizontal frames to form a substantially rectangular, grille-like structure; and

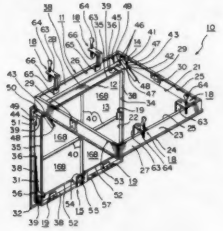
(d) a tapered upper edge on each of said vertical channel members and said vertical guard bars wherein said edge is tapered on the external side of said members and bars at an angle of approximately 45 to 70 degrees measured clockwise from a line running perpendicular to said members and bars, and wherein the apex of said members and bars is permanently affixed to said upper horizontal frame bar; said guard being releasably engaged within an existing window frame and secured by strucutral elements of the window and window frame.

4,593,493

ACCESS DOOR

Hiromitsu Naka; Takehiko Okushima, and Tatsuo Shoji, all of Yashio, Japan, assignors to Kabushiki Kaisha Naka Gijutsu Kenkyusho, Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 619,270
Claims priority, application Japan, Jun. 16, 1983, 58-108355
Int. Cl.[4] E05D *15/40*
U.S. Cl. 49—248 **4 Claims**



1. An access door comprising:

an outer square frame adapted to be disposed within an opening formed in an installation area such as a building ceiling or side wall;

an inner square frame having an upper end and an inwardly extending flange, said inner square frame disposed in a frame opening defined by said outer square frame and pivotally connected to said outer square frame for rotation between open and closed positions, said inner square frame having a joint finishing flange at the peripheral edge thereof to conceal a peripheral edge of said outer square frame when said inner square frame is in its closed position;

a cover plate attached to said inner square frame to close a frame opening defined by said inner square frame;

a pair of link hinge means provided on each of two selected sides of said outer square frame to pivotally connect said inner square frame to said outer square frame, said link hinge means each including a pair of parallel upper and lower long links, the leading end of said lower long link having a swing control arm, said swing control arm having a yoke bent toward said inner square frame for receiving said upper end of said inner square frame, a short follower link for pivotally connecting the leading ends of said upper and lower long links, link guide means provided with an anti-deflection guide means for preventing said lower long link and said swing control arm from deflecting as said cover opens and closes and for guiding said inwardly extending flange of said inner square frame as said cover closes, and a bracket connecting said upper and lower long links together and securing said link hinge means to said outer square frame; and

a locking means adapted to lock said inner square frame to said outer square frame when said inner square frame is in its closed position.

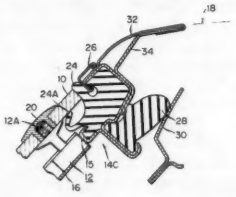
4,593,494

CONSTRUCTION OF DOOR GLASS GUIDE IN MOTOR VEHICLE DOOR

Kenzi Ono, Toyota, and Toshiyuki Ozawa, Aichi, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 29, 1985, Ser. No. 717,803
Claims priority, application Japan, Apr. 5, 1984, 59-49896[U]
Int. Cl.[4] E05F *11/38*
U.S. Cl. 49—374 **16 Claims**

1. A construction of a door glass guide in a motor vehicle door, wherein said construction comprises guide rollers mounted at upper positions of front and rear end edges of a door glass, being shifted inwardly from the door glass and guide portions integrally formed on vertical members disposed at front and rear sides of a door frame, for vertically, slidably guiding said guide rollers, and the outer surface of a vehicle body is substantially flush with the outer surfaces of said door glass and said door frame, characterized in that said guide



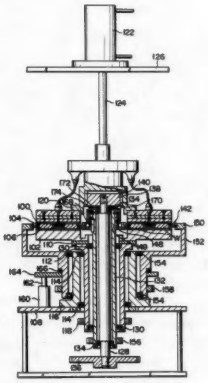
rollers are mounted at positions where said guide rollers come into abutting contact with the bottom end surface of a transverse member disposed at the upper side of said door frame when said door glass is fully closed.

4,593,495

POLISHING MACHINE

Hideo Kawakami, Numazu; Shinichi Tazawa, Mishima, and Masami Endo, Shizuoka, all of Japan, assignors to Toshiba Machine Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,663
Claims priority, application Japan, Nov. 25, 1983, 58-221828; Oct. 19, 1984, 59-219970
Int. Cl.[4] B24B *7/17*
U.S. Cl. 51—118 **13 Claims**



1. A polishing machine for polishing the surface of a workpiece comprising:

a base;

a driving shaft rotatably attached to the base;

a first surface plate rotatably attached to said base and provided with a plate surface, said first surface plate having a through-hole which the driving shaft is passed through;

a sun gear slidably connected to said driving shaft to slide in the axial direction of said driving shaft and provided with a projection enclosing said driving shaft, said projection extending along said driving shaft and having a threaded portion on an outer circumference thereof;

an internal ring gear on said base and arranged concentric with said sun gear and enclosing said sun gear;

a plurality of carriers arranged between said sun gear and said internal ring gear within the same plane, said carriers being in mesh with said sun gear and said internal ring gear, and lying on said first surface plate, each of the

carriers having a plurality of through-bores in which the workpieces are housed;

a driving means for moving said internal ring gear to engage with or disengage from said carriers, and means for rotating said internal ring gear;

a sun gear actuating member attached to said driving shaft, limited of its movement in the axial direction, and provided with a threaded portion which is screwed onto the threaded portion of the projection of said sun gear which serves as a feed screw for adjusting the axial location of the sun gear relative to the carriers;

a second surface plate arranged apart from said first surface plate and provided with a plate surface which faces that of said first surface plate;

a second surface plate moving means for moving said second surface plate to approach and separate from said first surface plate; and

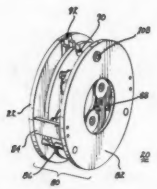
an abrasive member attached to the plate surface of at least one of said first and second surface plates to polish the surfaces of the workpieces.

4,593,496

CASSETTE FOR LOADING DISCS IN A GRINDING/POLISHING APPARATUS

Harold R. Klievoneit, Mesa, and Augustine G. Esposito, Phoenix, both of Ariz., assignors to St. Florian Company, Phoenix, Ariz.

Filed May 14, 1984, Ser. No. 609,814
Int. Cl.[4] B24B 7/17
U.S. Cl. 51—118 **22 Claims**



1. A cassette for supporting a plurality of centrally apertured discs to be ground/polished in a disc grinder/polisher apparatus having opposed grinding/polishing wheels, said cassette comprising in combination:

(a) a frame;

(b) means for securing said frame to the apparatus;

(c) means for supporting a plurality of the discs to be ground/polished intermediate the grinding/polishing wheels;

(d) means for rotatably mounting the plurality of discs to be ground/polished upon said supporting means, said mounting means comprising a cell for each engaged disc, each said cell including a plurality of peripherally grooved rollers for rotatably contacting the perimeter of the disc and a roller in contact with the perimeter of the central aperture of the disc for maintaining the perimeter of the disc in contact with said groove rollers;

(e) means for disengageably engaging said supporting means with said frame to permit simultaneous loading and unloading of the plurality of discs; and

(f) means for axially displacing said roller into and out of contact with the central aperture of the disc;

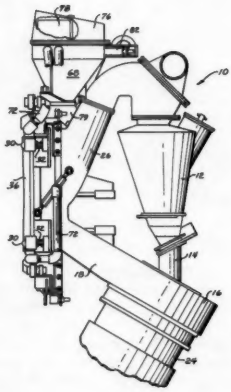
whereby, a plurality of discs may be mounted upon said supporting means remote from the grinding/polishing apparatus to minimize likelihood of damage to the discs from loading and unloading individual discs at the grinding/polishing apparatus and from transport of individual discs to and from the grinding/polishing apparatus.

4,593,497

ABRASIVE SEAL RECOVERY SYSTEM

David L. O'Dell, and Philip H. Diehn, both of Mishawaka, Ind., assignors to Wheelabrator-Frye Inc., Mishawaka, Ind.

Filed Mar. 8, 1984, Ser. No. 587,549
Int. Cl.[4] B24C 9/00
U.S. Cl. 51—424 **8 Claims**



1. In a blasting device having a blast head with an opening through which particulate material is projected at high velocity onto a surface for the treatment thereof, the device including sealing means around the opening adapted to contain most of the blasted particulate material within the blasting device for recycling; means for recovering and recycling particulate leakage material not contained by the sealing means including suction means adjacent the sealing means adapted for removing said leakage particulate material and means for returning the removed leakage particulate material to the blasting device for reuse; the means for returning the removed particulate material includes a recovery chamber having a particulate material storage hopper, means for removing the stored particulate material from the hopper for reuse, a leakage particulate material inlet adapted to receive particulate material from the suction means, hose means interconnecting the suction means and the leakage material inlet; the recovery chamber having a vacuum inlet adapted for connection to a source of vacuum air, vacuum air means, means interconnecting the vacuum air means and the vacuum air inlet of the recovery chamber whereby the vacuum means draws air and leakage particulate material from adjacent the blast head into the suction means, through the hose means and into the recovery chamber wherein the leakage particulate material is retained in the storage hopper as the air is further drawn to the vacuum air means; the means for removing the stored particulate material from the recovery chamber hopper for reuse includes passage means at the bottom of the hopper interconnecting the recovery chamber and the blast head through which particulate material in the recovery chamber hopper may be transferred to the head for reuse; wherein the blast head includes a blast corridor for directing particulate material at high velocity against a surface to be treated and a rebound corridor for returning the particulate material for reacceleration by the blast head; the passage means entering the blast head in the rebound corridor.

4,593,498

CONSTRUCTION COMPONENT FOR PRODUCING OF PREFERRED SHOT-IN STRUCTURES

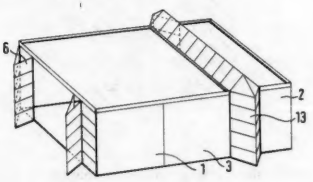
Eberhard Stauss, Munich; Hans-Rudolf Klein, Berg, and Alfons Thalmeir, Munich, all of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann AG, München-Reim, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,159

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1984, 8401113[U]; Jul. 16, 1984, 3426119

Int. Cl.[4] E04B 7/12

U.S. Cl. 52—18 11 Claims



1. A kit of components for erecting single-story structures and consisting of prefabricated concrete components that demarcate a space and perform a supporting function, comprising: a basic element with a hollow structural section having a cellular space with a rectangular cross-section, two parallel side walls, a floor slab, a roof slab, and two openings; a two-part folding door set into one of said two openings to comprise a front element fitted against each vertical side of the opening; said door being comprised at least partly of light-permeable material; each part of said door having at least two wings that can be swung around axes parallel to a vertical front side; said folding door not extending into and interior of said cellular space when said door is open and folded back toward the two vertical front sides; a rear element corresponding in cross-section to said basic element and covered box-like by a rear wall that can be erected to create a structure; said rear wall having an opening aligned with one of the two openings in said basic element with a gap therebetween; and an illumination element located in a gap between the basic element and rear element, and comprised at least partly of light-permeable material in a vicinity of a side wall and roof slab; said illumination element and said folding door comprising two light transmitting sources.

4,593,499

INTERIOR PANEL

Hiroshi Kobayashi, Tokyo; Toshio Yasunaga; Toshihiko Muro, both of Yokohama; Fumio Takeda, Terada, and Yutaka Tsuruta, Funabashi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Taisei Corporation, Tokyo, both of, Japan

Filed Nov. 23, 1984, Ser. No. 674,086

Claims priority, application Japan, Nov. 24, 1983, 58-220988

Int. Cl.[4] E04B 5/58, 5/48

U.S. Cl. 52—126.6 14 Claims

1. An interior panel which overlies the surface of a slab defining the inside space of a room to form the interior surface of the room so that a space to permit installation of signal transmission cables, power cables, and electric devices is formed between the interior panel and the slab surface, comprising:

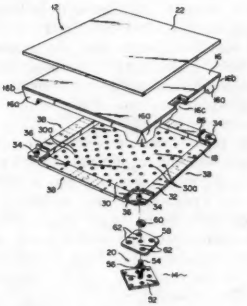
a panel member;

a cable separator; and

a plurality of support means fixedly arranged on the slab surface, said support means supporting the panel member at a predetermined distance from the slab surface and supporting the cable separator interposed between the panel member and the slab surface,

each said support means comprising a supporting portion contactingly supporting said cable separator and disposed such that the distance between the inside face of the panel member and the supporting portion is substantially equal to the distance between the supporting portion and the slab,

the cable seaparator having the form of a plate dividing the space between the panel member and the slab into a first space between the panel member and the cable separator and a second space between the cable separator and the slab,



the cable separator having a stepped surface at the peripheral edge portion, the support means supporting the cable separator by contact between the supporting portion and the stepped surface, said supporting portion and said stepped surface being configured for removal of the cable separator, inversion and replacement thereof, and continued support of said stepped surface by said supporting portion following said inversion and replacement.

4,593,500

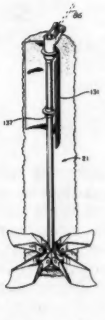
EARTH ANCHOR WITH LOAD PLATE

Gary Q. Watson, Odessa, Tex., assignor to Morrow Manufacturing Co., Inc., Tex.

Filed Aug. 1, 1983, Ser. No. 519,041

Int. Cl.[4] E02D 5/80

U.S. Cl. 52—162 26 Claims



1. An anchor adapted to be located in a generally vertical hole formed in the earth and substantially covered with earth, comprising:

elongated rod means having a first end and a spaced second end,

said first end of said rod means being adapted to be located at the lower end of a hole formed in the earth,

connecting means coupled to said second end of said rod

means and adapted to be located above the earth when the anchor is secured in place,

said connecting means being adapted to have a guy wire connected thereto for extension upward from said anchor to other structure, for support purposes along a line which is not aligned with the axis of said rod means and which intercepts the axis of said rod means,

end means coupled to said first end of said rod means and extending transversely outward therefrom,

support means having a plurality of flukes pivotally coupled thereto,

said support means being adapted to be located around said rod means near said first end of said rod means and moved toward said first end of said rod means near said end means such that said flukes will engage said end means and be pivoted outward into the earth surrounding the hole as said support means is moved further toward said first end of said rod means, and

an enlarged plate means coupled by coupling means to said rod means near said second end and at a position between said second end and said first end of said rod means for transferring a portion of a load, applied by the guy wire to said connecting means, to the wall of the hole,

said plate means having a width much greater than the maximum dimension of said rod means in a plane perpendicular to the length of said rod means and a length greater than its width,

said plate means being located on one side of said rod means with its length being generally parallel with the length of said rod means,

said coupling means preventing said plate means from moving transversely to the axis of said rod means.

4,593,501

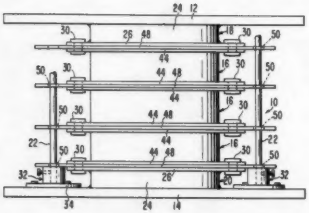
VIBRATION AND SHOCK ISOLATOR WITH ADJUSTABLE STIFFNESS

Gilles C. Delfosse, Marseille, France, assignor to Isosys, Inc., Palo Alto, Calif.

Filed Oct. 11, 1983, Ser. No. 540,227

Int. Cl.[4] E04H *9/02*; E04B *1/36*

U.S. Cl. 52—167 **4 Claims**



1. An isolator for protecting buildings and other structures from the effects of an earthquake comprising: an upper plate; a lower plate; a stack of elastic bearing elements between the upper and lower plates; means coupling the upper plate to the upper end of the lower end of the stack of bearing elements; means coupling the lower plate to the stack of bearing elements; means interconnecting each pair of adjacent bearing elements; an intermediate plate between each pair of bearing elements, respectively, the outer periphery of the intermediate plate being greater than the outer periphery of each adjacent bearing element, each intermediate plate having a plurality of spaced, outer peripheral holes therethrough, each hole being aligned with a respective hole through the next adjacent intermediate plate; and a number of rods extending through at least the aligned holes of at least a pair of the intermediate plates for providing lateral stiffness for the bearing element, the lengths of the rods differing from each other.

4,593,502

ENERGY ABSORBERS

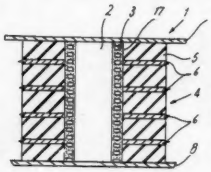
Ian G. Buckle, Berkeley, Calif., assignor to Development Finance Corporation of New Zealand, Wellington, New Zealand

Continuation-in-part of Ser. No. 504,725, Jun. 16, 1983, Pat. No. 4,499,694. This application Jan. 24, 1985, Ser. No. 694,253

Claims priority, application New Zealand, Jun. 18, 1982, 201015

Int. Cl.[4] E04B *1/98*

U.S. Cl. 52—167 **24 Claims**



1. In a cyclic shear energy absorber adapted to be interposed between two members for absorbing energy due to induced motion between said two members, said energy absorber including a first end portion engageable to one of said two members, a second end portion engageable to the other one of said two members, plastically cyclically deformable energy absorber members extending between said first and second end portions, and restraining means disposed about said energy absorber means in the region between said first and second portions, said restraining means having a flexible wall surface comprising adjacent layers for confining said energy absorber means during induced motion between said two members while permitting said energy absprber means to deform, the improvement comprising the provision of resilient layers between the adjacent layers of said flexible wall surface in said restraining means.

4,593,503

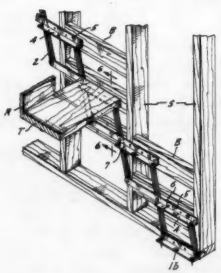
ADJUSTABLE STAIR GUIDE AND SUPPORT

Georg Koslowski, 6915 Marine Drive, West Vancouver, British Columbia V7W 2T4, Canada

Filed May 13, 1983, Ser. No. 494,759

Int. Cl.[4] E04F *11/00*

U.S. Cl. 52—188 **4 Claims**



1. In a stairway construction including stair treads and fixed supports for carrying the weight of the opposite end portions, respectively, of the stair treads, the improvement comprising a stair guide and support including several horizontal links including a top horizontal link, said horizontal links being substantially uniformly spaced elevationally and having substantially horizontally extending flanges for supporting corresponding end portions of the stair treads, and several upright substantially parallel links pivoted to said horizontal links to

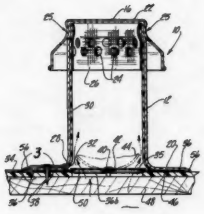
form a lazy tongs linkage in inclined attitude, said horizontal links being immovably secured to the weight-bearing supports in fixed relative relationship and said upright links extending at a substantial acute angle to the vertical.

4,593,504

PRESSURE EQUALIZING ROOF VENT

Charles Bonnici, and James W. Ballard, both of Livonia, Mich., assignors to Jimco Products, Livonia, Mich.

Filed Feb. 14, 1985, Ser. No. 701,722
Int. Cl.[4] E04B 7/00
U.S. Cl. 52—199 **16 Claims**



1. A vent for equalizing air pressure exerted on a roof of a building, comprising:

a generally cylindrical, metal tube extending upwardly from said roof and through which air may pass from the interior of said building into the open atmosphere;

a flange on one end of said tube for mounting said vent on said roof, said flange being adapted to overlie said roof;

a valve assembly for controlling the flow of air through said tube, said valve assembly including a metal plate extending across said tube and secured to said flange, said plate being disposed between said roof and said flange, said plate including a central opening therein through which air may pass, said valve assembly further including a valve member mounted on said plate for selectively closing said opening; and,

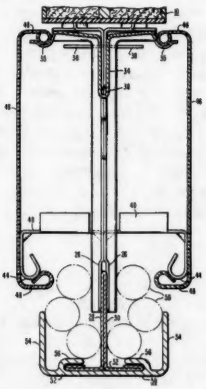
means sandwiched between said flange and said plate for thermally insulating said flange and said tube from said plate to prevent condensation of moisture on said plate.

4,593,505

PANEL BASE ELECTRICAL RACEWAY

Robert L. Russell, Kentwood, Mich., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 8, 1984, Ser. No. 618,603
Int. Cl.[4] E04B 5/48
U.S. Cl. 52—221 **8 Claims**



1. An electrical raceway for a space dividing wall panel system, said electrical raceway comprising:

at least a pair of spaced frame members constructed and arranged to be secured to the bottom of a wall panel said spaced frame members having an electrical component receiving aperture therein, and cover retaining members extending laterally therefrom;

an elongated inverted T-shaped member interconnecting said spaced frame members;

a base cover releasably secured to said cover retaining members on each side of said frame members; and

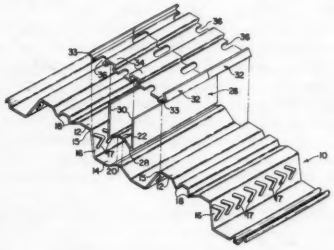
an elongated flexible boot having a base portion and an upwardly directed side portion, terminating in an upper edge, on each side edge of said base portion, said elongated flexible boot secured to the horizontal portion of said inverted T-shaped member with the upper edges of said upwardly directed flange portions terminating substantially below and inward of the bottom edge of said base covers.

4,593,506

CELLULAR FLOORING SYSTEM AND METHOD OF USING SAME

Thomas W. Hartman, Pittsburgh, and Thomas G. Ryan, Bethel Park, both of Pa., assignors to Cyclops Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 441,052, Nov. 12, 1982, abandoned. This application Jul. 26, 1983, Ser. No. 517,366
Int. Cl.[4] E04B 5/48
U.S. Cl. 52—221 **26 Claims**



1. A cellular flooring system of the type supported by supporting beams of a floor comprising:

(a) at least one corrugated metal sheet having spaced apart valley and crest portions extending longitudinally the entire length of the sheet with an inclined webbing connecting each adjacent crest portion and valley portion, the sheet positioned on the supporting beams of a floor in a manner whereby the valleys open upwardly away from the supporting beams;

(b) longitudinally extending dividing means adapted to be supported in any valley, placed into at least one selected valley and creating a plurality of adjacent parallel conduits within the selected valley, each conduit longitudinally disposed in the selected valley and each conduit having an open top surface allowing for unrestricted placement of service lines and the like into each conduit through the open top surface;

(c) cover means positioned on the sheet over the selected valley and supported by crest portions of the sheet adjacent to the selected valley to create with said conduits a plurality of adjacent closed cells in the selected valley, the cover means formed to provide at least one opening to allow for access to all of the adjacent cells from a single localized region whereby eliminating the necessity for any openings in the corrugated sheet to provide access to any service lines and the like which may be placed in said cells; and

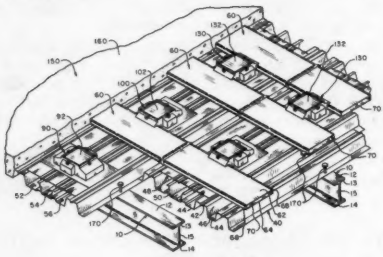
(d) positioning means provided in at least one of the valley portions of the sheet and the cover means and abutting the dividing means for securing the dividing means in a desired position within the selected valley.

4,593,507

TRENCHLESS UNDERFLOOR CONDUIT SYSTEM

Thomas W. Hartman, Pittsburgh, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.

Filed Nov. 7, 1984, Ser. No. 669,074
Int. Cl.[4] E04F *17/08*
U.S. Cl. 52—221 **11 Claims**



1. A trenchless underfloor conduit system for distribution of electrical conductors, service lines and the like comprising:

(a) at least one longitudinally extending beam;

(b) corrugated deck sheet means supported by said at least one longitudinally extending beam, said deck means having a plurality of alternating spaced-apart parallel valleys and crests therein with a webbing connecting adjacent valleys and crests, said valleys and crests extending transversely with respect to said beam;

(c) closure means attached to said deck means and enclosing at least one of a selected valley and a selected crest to form at least one enclosed conduit, said conduit having an access opening in a top surface thereof;

(d) at least one enclosed duct member overlying and supported by said deck means, said at least one duct member extending substantially parallel with respect to said beam, said duct member having an opening in a side wall portion thereof;

(e) an access housing supported on said deck means and having a removable top cover, said access housing positioned beside the duct member and having an opening in its base aligned with the opening in said conduit and an opening in a side wall portion thereof aligned with the side wall opening of the duct member whereby access into the at least one duct and into the conduit through the access housing is provided by removing the top cover and access between the at least one duct and the conduit is provided through the access housing; and

(f) a substantially uninterrupted layer of concrete provided over said deck means and at least one duct member and around the access housing whereby the top cover of the access housing is substantially coplanar with an upper floor surface of the concrete layer.

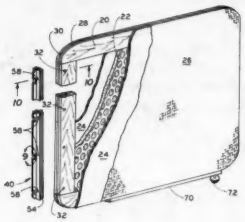
4,593,508

EXTRUSION

Frank Curatolo, 130 Overlook Ave., Hackensack, N.J. 07601

Filed Apr. 11, 1985, Ser. No. 722,061
Int. Cl.[4] E05D *15/56*
U.S. Cl. 52—239 **2 Claims**

1. An assembly comprising in combination one or more similarly constructed partition panels secured to one or more similarly constructed connecting members for subdividing the area of a room into smaller configurations, each of said partition panels having a peripheral edge in which a groove is centrally located, each of said connecting members comprising an elongated bar having a first pair of opposed elongated outwardly extending tongues each being adapted to enter into said groove in the peripheral edge, said groove and said tongue being provided with cooperating means for removably interengaging said panel and bar on insertion of said tongue into said groove, and said each bar having a second pair of longitudinal edges extending perpendicularly of said tongues each having a channel formed therein and pin members extending



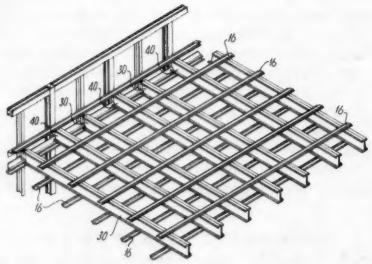
transversely across said channels, said channel and pin members being adapted to receive and secure the tongue members of other similar constructed bars.

4,593,509

BUILDING STRUCTURE

Derek Linton, Paddock Wood, England, assignor to Linton Systems Limited, Marlow, England

Filed Jan. 26, 1983, Ser. No. 461,274
Claims priority, application United Kingdom, Oct. 7, 1982, 8228660
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—262 **12 Claims**



1. A joist assembly structure comprising a plurality of substantially parallel horizontally spaced joists each having two opposed ends, an upper surface and a lower surface, each joist being supported at the two opposed ends thereof, at least some of said joists being inclined upwardly relative to the remaining joists which are substantially horizontal so that the inclined joists extend above said remaining joists, a first set of transverse members resting on top of and secured to the top of the upper surfaces of said inclined joists, and a further set of transverse members extending underneath and connected to the lower surfaces of said remaining joists, the said structure being adapted to be attached to ceiling or roofing materials supported on said transverse members.

4,593,510

PRE-FABRICATED AND MODULAR CHIMNEY FACADE SYSTEM

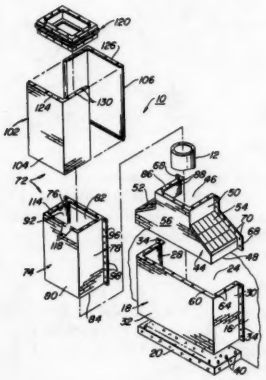
R. Wayne Newsome, 13132 Williamfield Dr., Ellicott City, Md. 21043

Filed Oct. 31, 1984, Ser. No. 666,761
Int. Cl.[4] E04C *1/00*
U.S. Cl. 52—314 **34 Claims**

1. A pre-fabricated and modular chimney facade system for

enclosing a chimney stack passing therethrough, said chimney facade system being adapted to be fixedly secured to an external wall of a building structure comprising:

(a) a one-piece base housing fixedly secured to a base foundation member positionally located external and adjacent said building structure and directly secured to an external surface of said external wall of said building structure, said base housing defining a through passage having a first cross-sectional area greater than a cross-sectional area of said chimney stack; and,



(b) a one-piece transition housing removeably mountable and fixedly securable to said one-piece base housing and said external wall of said building structure, said one-piece transition housing defining a transition through passage of diminishing cross-sectional area from a first section to a second section thereof, said transition housing first section opening being substantially equal to said base housing through opening cross-sectional area and said transition housing second section opening having a cross-sectional area greater than said cross-sectional area of said chimney stack.

4,593,511

PANEL FOR EXTERIOR INSULATION

Tapio K. Hakasaari, Palokka, Finland, assignor to Oy Partek AB, Parainen, Finland

Filed May 31, 1984, Ser. No. 615,789

Claims priority, application Finland, Jun. 1, 1983, 831960

Int. Cl.[4] E04B *1/74*

U.S. Cl. 52—404 **5 Claims**

1. A pre-fabricated, modular insulating panel for cladding attachment to the exterior wall of an exterior building comprising:

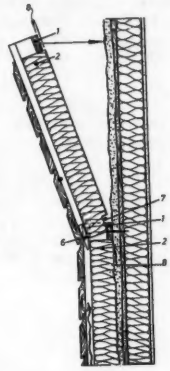
exterior facing means having inner and outer surfaces and lateral edges;

a plurality of spaced facing means-fastening strips secured to the inner surface of said facing means;

elevation means secured to each of said facing means-fastening strips adjacent a top edge thereof and projecting inwardly therefrom;

an elongated panel-fastening strip secured to said elevation means and adapted to be fastened to the exterior wall of the building; and

compressible insulation means mounted from and spanning said facing means-fastening strips and extending inwardly of said panel-fastening strip whereby said insulation means



is compressed against the building exterior wall when said panel-fastening strip is fastened to said wall.

4,593,512

FACING MATERIAL FOR BUILDING AND METHOD FOR CONNECTING SAME

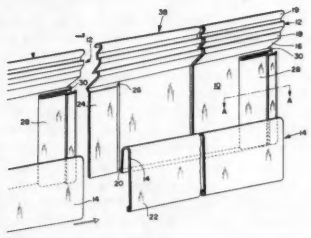
Motokatsu Funaki, 430 Shimotsuchidana, Fujisawa-shi, Kanagawa-ken, Japan

Filed Jul. 31, 1984, Ser. No. 636,443

Claims priority, application Japan, May 23, 1984, 59-102515

Int. Cl.[4] E04D *1/00*

U.S. Cl. 52—519 **8 Claims**



1. A facing material for a building comprising

a laterally extending flat plate body having an upper fit-in section and a lower fit-on section integrally formed at the upper and lower ends thereof in a manner to inward project from said flat plate body, respectively;

said upper fit-in section and lower fit-on section of said flat plate body being adapted to be respectively water-tightly engaged with the lower fit-on section of an upward adjacent facing material and the upper fit-on section of a downward adjacent facing material to connect the vertically adjacent facing materials to one another; and

said flat plate body also having a side fit-in section integrally formed at one side end thereof in a manner to outward project from said flat plate body and a side fit-on section integrally formed at the other side end thereof in a manner to be positioned at the inside of said flat plate body, said side fit-on section of said flat plate body being adapted to allow the side fit-in section of a laterally adjacent facing material to be securely fitted therein to connect the laterally adjacent facing materials to one another, said upper fit-in section being connected through an upper connec-

tion section upward inward extending from the upper end of said flat plate body to said flat plate body, said side fit-in section being connected at the upper end thereof to said upper fit-in section, and being formed along the entire vertical direction of said flat plate body to allow the lower end thereof to be free and positioned on the same plane as an extension of the lower end of said flat plate body.

4,593,513

BUILDING BLOCK OR PANEL

Frank Stratton, 144 Treasure Road, Queens Park, Western Australia, Australia

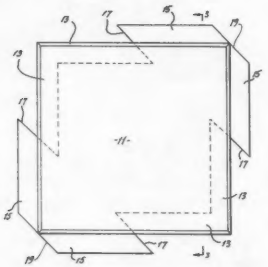
PCT No. PCT/AU82/00184, § 371 Date Jul. 6, 1983, § 102(e) Date Jul. 6, 1983, PCT Pub. No. WO83/01803, PCT Pub. Date May 26, 1983

PCT Filed Nov. 11, 1982, Ser. No. 513,963

Claims priority, application Australia, Nov. 12, 1981, PE1533

Int. Cl.⁴ E04C *1/30*

U.S. Cl. 52—578 **22 Claims**



1. A building block or panel having the shape of a right parallelepiped having edge faces and two opposed major faces, said edge faces being formed to interlockingly engage with edge faces of similar building blocks wherein two pairs of adjacent edge faces at opposed sides of the block are each formed with an elongated recess extending from and through a respective corner of said adjacent edge faces to an intermediate location on each edge face, each edge face also being formed with an elongated projection adjacent to said recess and extending from said intermediate location to a successive corner on each edge face, said projection being configured to be received in a recess of a corresponding block;

each projection having an end, adjacent to its respective recess being contoured to define at least a portion inclined at an angle of less than 90° between the face and base of the respective recess wherein the other end of each projection has a face of complimentary configuration.

4,593,514

SPACE FRAME

Todd R. Smith, Washtenaw, Mich., assignor to GTE Products Corporation, Stamford, Conn.

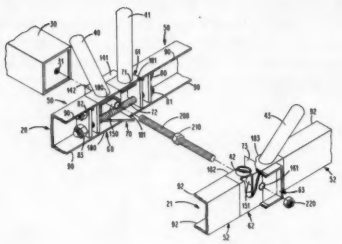
PCT No. PCT/US84/01508, § 371 Date Nov. 5, 1984, § 102(e) Date Nov. 5, 1984, PCT Pub. No. WO86/01848, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 19, 1984, Ser. No. 784,289

Int. Cl.⁴ F04H *12/06*

U.S. Cl. 52—648 **7 Claims**

1. A space frame comprising a combination of truss modules and transverse chords being interconnected by transverse fastening means; said transverse chords being parallel to each other; said truss modules being alternatingly by arranged in two parallel planes; each truss module comprising a plurality of web members, connecting members, and split longitudinal chords; said connecting members having interface surfaces; said split longitudinal chords having interface surfaces; said web members and said connecting members being affixed to said split longitudinal chords to form said truss modules; said truss modules being connected to each other at said interface surfaces of said split longitudinal chords by said transverse fastening means located within said truss modules interconnected with said transverse chords; and said transverse chords being connected at said first interface surfaces of said connecting members of each truss module by said transverse fastening means to form said space frame.



4,593,515

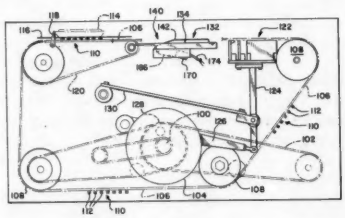
DROPPED-ARTICLE SENSOR AND WRAPPING MACHINE INTERRUPT

Dallas A. Margraf, Spring Valley, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Mar. 18, 1985, Ser. No. 712,939

Int. Cl.⁴ B65B *57/16*

U.S. Cl. 53—56 **20 Claims**



1. In a wrapping machine including a feed-in station for receiving packages to be wrapped, a wrapping station whereat sheets of wrapping material are wrapped about said packages and conveyor means for conveying said packages along a conveyor path extending between and including said feed-in station and said wrapping station, an improvement comprising dropped-article sensing means positioned beneath said conveyor path between said feed-in station and said wrapping station for catching articles dropped from said conveyor path and for generating a wrapping machine stop signal in response thereto whereby a dropped-article must be retrieved before restarting said wrapping machine and said dropped article may be salvaged.

4,593,516

APPARATUS FOR FORMING TIGHT PACKAGES

Robert Alameda, 35 Hawthorne St., Salinas, Calif. 93901, and Raymond Ash, Salinas, Calif., assignors to Robert Alameda and Richard P. Cooper, both of Salinas, Calif.

Filed Feb. 4, 1985, Ser. No. 697,984

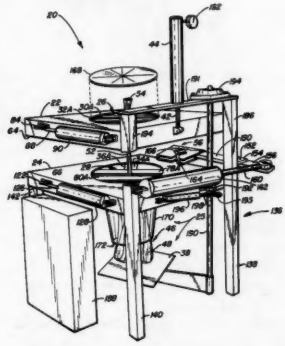
Int. Cl.⁴ B65B *51/04, 57/00*

U.S. Cl. 53—75 **14 Claims**

1. An automatic bay tying apparatus formed to produce a

tight package from a bag loosely containing a substance therein, the apparatus including first gripping means formed to tightly grip the bag proximate an open end thereof, second gripping means formed to slidably engage the bag intermediate the first gripping means and the substance and formed to constrict the bag to form a neck, displacement means formed and coupled to produce relative displacement between the first gripping means and the second gripping means to cause sliding of the bag with respect to the second gripping means until the neck is positioned immediately proximate the substance, and closure applying means formed to apply a bag closure to the bag closely proximate the neck, wherein the improvement in the bag typing apparatus comprises:

bag guiding and support means formed to receive the bag and substance from a bag loading apparatus and formed to support the bag and substance in a position for gripping by the first and second gripping means;



the first and second gripping means each including means mounting said gripping means for movement between an open position permitting movement of the bag and product from the bag loading apparatus to the bag guiding and support means and the closed position gripping the bag;

means for automatically actuating the first gripping means and the second gripping means to cause movement from the open position to the closed position when the bag and substance are supported on the bag guiding and support means; and

the displacement means further having pressure sensing means formed to terminate relative displacement of the gripping means upon sensing of a predetermined pressure between the second gripping means and the bag and substance and formed to actuate the closure applying means to apply a bag closure upon sensing of the predetermined pressure.

4,593,517

METHOD AND APPARATUS FOR PACKING GOODS

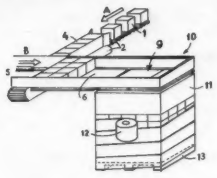
Jari Mattila, Kotimäentie 6, Loimaa, Finland

Continuation-in-part of Ser. No. 342,009, Jan. 6, 1982, abandoned. This application Apr. 23, 1985, Ser. No. 726,104

Int. Cl.[4] B65B *35/50*

U.S. Cl. 53—441 **10 Claims**

1. A packing method for packing consumer packages (a) directly onto a pallet (13) in which the packages are arranged on a support plate (9) to form a load layer (c), which load layer is supported on the sides by means of a guide frame (11) and wherein the support plate (9) is removed, so that the load layer (c) is immediately slid onto one of an empty pallet located below the support plate, and a previous load layer located on the pallet (13), and the pallet (13), together with its load layers, being lowered by the height of one load layer, characterized in that the packages are wrapped with a final wrapping material (44) simultaneously as new packings emerge from below the guide frame (11) and that the wrapping material (44) is spread so quickly that a whole load layer (d) has not totally appeared



from below the guiding frame before it has already been wrapped.

4,593,518

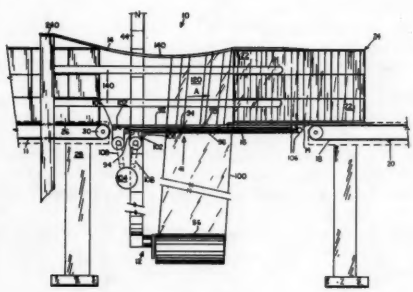
FLEXIBLE WRAPPING APPARATUS

William G. Lancaster, Louisville, Ky., assignor to Lantech, Inc., Louisville, Ky.

Filed Aug. 17, 1983, Ser. No. 523,975

Int. Cl.[4] B65B *13/12*

U.S. Cl. 53—556 **18 Claims**



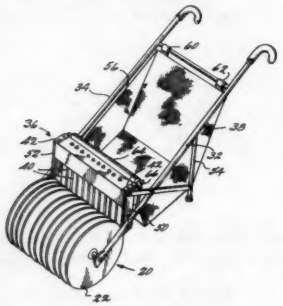
1. Apparatus for continuously wrapping consecutive loads of varying sizes and unitizing the loads into wrapped packages comprising conveyor means adapted to receive a plurality of loads spaced apart, wrapping means positioned adjacent said conveyor means, said wrapping means comprising a frame, a roll dispenser means rotatably mounted on said frame, and conveying means axially aligned to receive said loads from said conveyor means and support said loads, a plurality of flexible support members mounted to said frame and extending downstream from said frame to a wrapped load, said roll dispenser means being adapted to hold a roll of film material and wrap said material across said support members, said conveying means, each said load and the space between adjacent loads, thereby forming the material into tubes wrapped around space between each load in said wrapping means and the downstream wrapped load, said tubes extending between the consecutive loads and connecting said consecutive loads, drive means connected to said roll dispenser means to drive said roll dispenser means so that it deposits material across said support members and loads, and film stretching means mounted to said roll dispenser means, said film stretching means being adapted to engage the film material substantially stretching and tensioning the film material being dispensed from said roll to form said tube under tension against said consecutive loads and said flexible members; means positioned downstream from said conveying means adapted to carry said loads and said tensioned tube connecting consecutive loads away from said wrapping means to a package severing station.

4,593,519

APPARATUS FOR PICKING UP OBJECTS RANDOMLY DISTRIBUTED ON A SURFACE

Jerome W. Kimball, 2602 Whitaker St., Savannah, Ga. 31401

Filed Sep. 22, 1983, Ser. No. 534,909
Int. Cl.[4] A01D *51/00*
U.S. Cl. 56—328 R 16 Claims



1. Apparatus for picking up objects randomly distributed on a surface comprising:

a plurality of thin flexible cylindrical discs having a given diameter;

a plurality of spacers of softer and more flexible material than said discs;

means for mounting said discs coaxially for rotation and thereby rolling movement over said surface with at least one spacer between adjacent discs so that said discs are separated at their periphery and flexibly displaced from adjacent discs to wedge said objects therebetween as said discs are rolled over said objects and the wedged objects thereafter rotate with said discs; and

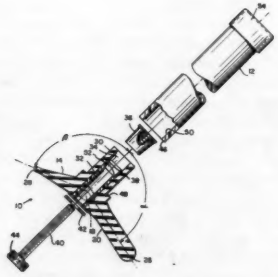
means for removing said wedged objects from between said discs.

4,593,520

RAKE HEAD FOR A RAKING IMPLEMENT

Andrew J. Krizman, 5434 S. Raleigh Dr., South Bend, Ind. 46614

Filed Feb. 6, 1985, Ser. No. 698,610
Int. Cl.[4] A01D *7/00*
U.S. Cl. 56—400.06 28 Claims



1. A rake head for a raking implement, comprising:

a crosshead formed from a resilient, elastomeric material;

a plurality of tines extending from the crosshead, said tines being integrally formed with the crosshead from said resilient, elastomeric material; and

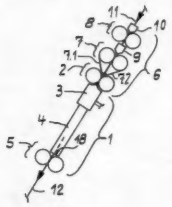
resilient stiffening means for increasing the rigidity of the resilient crosshead along a transverse axis thereof so as to allow the crosshead to return to its original shape after flexure.

4,593,521

JET SPINNING DEVICE

Herbert Stalder, Vord, and Emil Briner, Winterthur, both of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Oct. 3, 1983, Ser. No. 538,678
Claims priority, application Switzerland, Oct. 29, 1982, 6311/82
Int. Cl.[4] D01H *5/28;* D02G *1/16;* B65H *51/16*
U.S. Cl. 57—328 11 Claims



1. A jet spinning device comprising:

a delivery roller pair;

a pneumatic twist jet arranged after said delivery roller pair for receiving and forwarding an unspun yarn delivered by the delivery roller pair;

an output roller pair arranged after the twist jet for receiving and forwarding a spun yarn delivered by the twist jet;

said output roller pair defining a converging space;

a pneumatic guide tube operatively associated with the twist jet;

said pneumatic guide tube projecting sufficiently close to the output roller pair such that the spun yarn is forwarded into the converging space of the output roller pair and is thereby automatically entrained by the output roller pair;

said pneumatic guide tube possessing a rim bounding an outlet opening; and

said pneumatic guide tube together with said outlet opening thereof projecting sufficiently close to the output roller pair such that an air outlet cross-section defined between said rim of said outlet opening and a cylindrical surface of the output roller pair is not substantially smaller than an opening cross-section of the pneumatic guide tube and which opening cross-section is measured normal to the direction of flow of air through said pneumatic guide tube.

4,593,522

METHOD AND APPARATUS FOR PRODUCING SPUN YARN

Yasuhiro Ishizuka; Takashi Nakayama, and Seiichi Yamagata, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,441
Claims priority, application Japan, Jun. 3, 1982, 57-95212
Int. Cl.[4] D01H *1/135, 7/885, 7/892*
U.S. Cl. 57—400 14 Claims

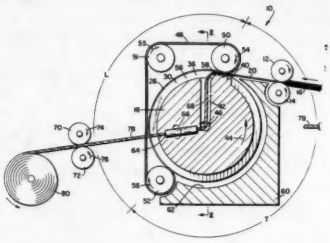
1. A method for producing a spun yarn having true twist, wherein the method employs a spinning rotor; said method comprising the steps of:

I. extracting staple fibers from a bundle of staple fibers; and

II. collecting the extracted staple fibers on the periphery of the spinning rotor; and

III. recontacting the extracted fibers with the bundle of staple fibers to form a combined untwisted yarn; and

IV. twisting the combined untwisted yarn to produce a twisted yarn; and



V. false twisting the twisted yarn within the rotor; and

VI. withdrawing the twisted yarn from the spinning rotor.

4,593,523

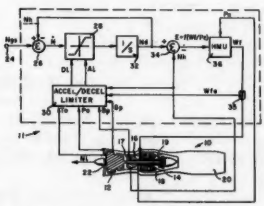
METHOD AND APPARATUS FOR ACCELERATION LIMITING A GAS TURBINE ENGINE

David J. Hawes, Pierrefonds, Canada, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 217,374, Dec. 17, 1980, abandoned. This application Jul. 1, 1983, Ser. No. 510,124

Int. Cl.[4] F02C *9/28*

U.S. Cl. 60—39.281 **6 Claims**



1. In a fuel control system for a gas turbine engine including: means for generating an actual speed signal proportional to the actual turbine speed of the gas turbine engine; means for generating a scheduled speed signal proportional to a desired engine output power; means for generating a demanded speed signal proportional to the time integral of a difference signal; means for generating said difference signal proportional to the difference between said scheduled speed signal and said demanded speed signal; means for generating an error signal proportional to the difference between said demanded speed signal and said actual speed signal; and means for controlling the fuel flow to the gas turbine engine as a function of said error signal; an improvement comprising:

means for limiting said difference signal to a limit value; and means for generating said limit value as a function of the fuel flow to the engine Wf, and the speed of the engine N;

said limit valve generating means including a memory device for storing a schedule of an acceleration parameter as function of engine speed, wherein said memory device stores values of the ratio $(dN/dt \times N)/Wf$.

4,593,524

CONTROL DEVICE FOR A POWER-DRIVEN AIR PUMP FOR A CAR

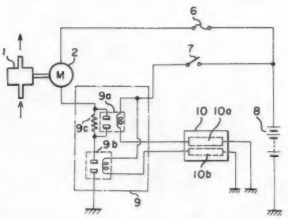
Akio Matsumoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,552

Claims priority, application Japan, Oct. 24, 1983, 58-164397[U]

Int. Cl.[4] F01N *3/22*

U.S. Cl. 60—289 **1 Claim**



1. A controlled device for a power driver D.C. motor air pump used for an exhaust device for automobiles which reburns and purifies exhaust gas emitted by the engine of said automobile comprising:

a plurality of air sensors;

means for sensing air quantity each having two terminals;

variable control means coupled to plurality of air sensors and said d.c. motor comprising:

at least two serially connected relays in which all of said relays, except for one, at the grounded side respectively, have parallel resistors and said plurality of air sensors corresponding in number to said relays, one terminal of each of said air sensors is connected to a field coil of each of said relays and the other terminal of said air sensor is grounded when said each sensor is actuated.

4,593,525

METHOD AND APPARATUS FOR OPERATING A PISTON DRIVEN INTERNAL COMBUSTION ENGINE HAVING AN EXHAUST GAS TURBOCHARGER

Hans Mezger, Freiberg, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 440,957, Nov. 12, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 756,932

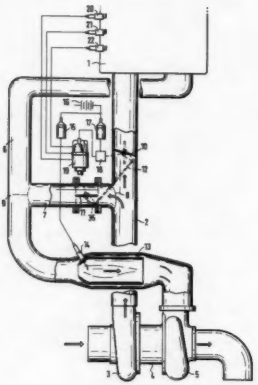
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1981, 3145114

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—606 **3 Claims**

1. A method of operating a piston-driven internal combustion engine of a motor vehicle having an exhaust gas turbocharger, in which exhaust gases from cylinders of the engine are conducted to an afterburner chamber and subsequently to an exhaust gas turbine of the turbocharger and in which air under admixture of fuel is blown into the cylinders of the engine by a charging compressor driven by the exhaust gas turbine by way of a throttling arrangement, comprising the steps of substantially inhibiting the engine combustion process when the engine is being driven by the inertia of the motor vehicle, conducting noncombusted fuel-air admixture from the cylinders into the afterburner chamber, branching off the charging air from a line from the charging compressor to the cylinders of the internal combustion engine and conducting the charging air to the afterburner chamber, controlling the substantial inhibition of the engine combustion process and the branching off of the charging air as a function of the position of the throttling arrangement in the charging air line, and combusting the fuel-air admixture in the afterburner chamber to thereby generally preclude a drop in turbocharger speed.

2. A piston-driven internal combustion engine with an exhaust gas turbocharger, in which exhaust gases from a cylinder of the engine are conducted to an afterburner chamber and subsequently to an exhaust gas turbine of the exhaust gas turbocharger, and in which air under admixture of fuel is blown into the cylinder by a charging compressor driven by the exhaust gas turbine by way of a throttling arrangement, comprising control means operable when the engine is being driven by the inertia of the motor vehicle for substantially inhibiting the engine combustion process and for conducting noncombusted fuel-air admixture from the cylinder into the afterburner chamber, said control means being operable to branch off charging air from a line from the charging compressor means to the cylinder means of the internal combustion engine and to conduct the charging air to the afterburner chamber means when the engine is being driven by the inertia of the vehicle, said control means being operable to control the substantial inhibition of the engine combustion process and to branch off charging air as a function of the position of the throttling arrangement in the charging air line, wherein air-fuel admixture combusted in the afterburner chamber generally maintains turbocharger speed.



4,593,526

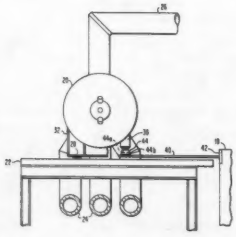
STEAM TURBINE SYSTEM INSTALLATION WITH PROTECTION OF PIPING AGAINST SEISMIC LOADING

Joseph Pankowiecki, Casselberry, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 27, 1984, Ser. No. 644,753

Int. Cl.[4] F01K *19/00*

U.S. Cl. 60—657 **7 Claims**



1. A steam turbine system installation with protection against seismic loading for piping between parts of the system comprising:

at least one steam turbine rigidly mounted on a substantially fixed turbine foundation;

an auxiliary part of the turbine system mounted by a selectively yielding mounting system on a substantially fixed auxiliary foundation spaced from said turbine foundation;

piping connected between said steam turbine and said auxiliary part for fluid flow therebetween;

said mounting system for said auxiliary part comprising means for allowing horizontal movement of said auxiliary part in relation to said auxiliary foundation in response to thermal expansion and contraction of said piping and means for resisting movement of said auxiliary part in relation to said auxiliary foundation due to seismic loading.

4,593,527

POWER PLANT

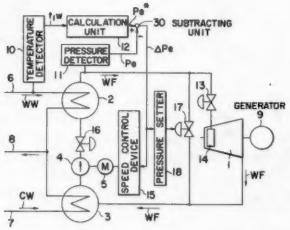
Yasunobu Nakamoto; Toshiro Terayama, both of Yokohama, and Mikio Takayanagi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 11, 1984, Ser. No. 629,818

Claims priority, application Japan, Jan. 13, 1984, 59-4509

Int. Cl.[4] B60H *1/00*; B61D *27/00*; F01K *13/02*

U.S. Cl. 60—660 **20 Claims**



1. A power plant comprising:

an evaporator for transferring heat to a working fluid from a heat source whose temperature is subject to variation, thereby evaporating the working fluid;

a turbine driven by the evaporated working fluid;

means for detecting the temperature of the heat source;

means for calculating an optimum value of a physical parameter of the working fluid relating to the evaporation at the evaporator in accordance with the detected temperature; and

means for controlling in accordance with said calculated optimum value, evaporation of the working fluid at the evaporator comprising:

(a) means for detecting an actual value of said physical parameter of the working fluid at the outlet of the evaporator;

(b) means for determining the deviation of the detected actual value of said physical parameter from the calculated optimum value; and

(c) means for controlling the evaporation in accordance with the deviation.

4,593,528

RAPID TRANSIENT RESPONSE CHEMICAL ENERGY POWER PLANT APPARATUS AND METHOD

David A. Bailey, Tucson, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

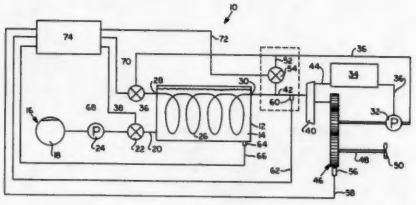
Filed Sep. 24, 1985, Ser. No. 779,542

Int. Cl.[4] F01K *13/02, 21/00*

U.S. Cl. 60—673 **23 Claims**

1. Power plant apparatus comprising: reaction chamber means for containing a reactive metallic fuel; boiler tube means in association with said reaction chamber means defining an

inlet, an outlet, and being disposed in heat receiving relationship with said metallic fuel; phase change liquid working fluid source means for supplying said liquid working fluid pressurized to said inlet, first feed rate control valve means for selectively regulating the rate of supply of said working fluid to said inlet; conduit means for communicating the vapor of said pressurized working fluid from said outlet to a vapor pressure expanding motor; attemperating means for communicating liquid working fluid from said source thereof to said conduit; and second feed rate control valve means for selectively regulating the rate of communication of said liquid attemperating working fluid to said conduit, reactant source means for supplying an exothermically reactive reactant to said reaction chamber means, and third reactant feed rate control valve means for selectively regulating the rate of supply of said reactant to said reaction chamber, first sensor means for producing a first signal indicative of the power output of said



vapor pressure expanding motor, second sensor means for producing a second signal analogous to temperature of pressurized vapor flowing via said conduit to said expanding motor, and third sensor means for producing a third signal analogous to temperature of said metallic fuel, control means for receiving said first, second, and third signals and providing respective fourth, fifth, and sixth control signals individually to said first, second, and third control valve means for selectively variably opening and closing the latter, wherein said control means comprises first summation means for receiving said fourth and said fifth control signals and producing a seventh signal analogous to a weighted summation thereof, and multiplier means for receiving said seventh signal along with an eight signal indicative of an error value between said third signal and a selected value therefor and providing the product of said seventh and eighth signals as a ninth signal productive of said sixth control signal.

4,593,529

METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE AND PRESSURE OF CONFINED SUBSTANCES

Valentine L. Birochik, Box 8416, Swissvale, Pa. 15218

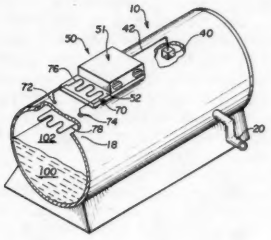
Filed Dec. 3, 1984, Ser. No. 677,740
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **9 Claims**

1. An apparatus for controlling the temperature and pressure of confined substances comprising:

a. tank means having interior and exterior portions and adapted to receive a pressurized substance within the interior portion thereof;

b. thermoelectric heat pump means including cold plate means, heat sink means, a semiconductor material positioned between said cold plate and heat sink means and a power supply electrically connected to said semiconductor material, said heat pump means attached to said tank in a manner whereby undesired heat may be removed from and desired heat may be added to the interior of the tank by means of thermal conduction between the heat pump means and the tank interior;

c. temperature sensing means and pressure sensing means each operatively associated with the interior of the tank and electrically connected to the heat pump means to activate the heat pump to remove heat from the tank when at least one of the temperature and pressure rises above a predetermined maximum level and to add heat to the tank when at least one of the temperature and pressure falls below a predetermined minimum level; and



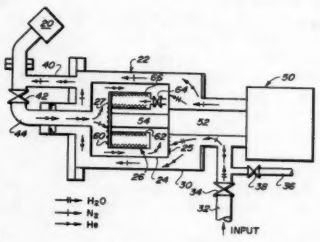
d. auxiliary heat conducting means attached directly to at least one surface of the cold plate of the heat pump means and placed in thermal communication with the interior of the tank to increase the efficiency of thermal transfer between the cold plate and the tank interior.

4,593,530

METHOD AND APPARATUS FOR IMPROVING THE SENSITIVITY OF A LEAK DETECTOR UTILIZING A CRYOPUMP

Ralph C. Longsworth, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 10, 1984, Ser. No. 598,622
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **20 Claims**



1. In a mass spectrometer leak detector system including means to remove certain gases from the testing atmosphere so that the system can detect the presence of a tracer gas, the improvement comprising:

said means includes a cryopump having a first surface or warm panel to freeze out water vapor and carbon dioxide, a second surface or cold panel to freeze out nitrogen, oxygen, argon, carbon monoxide, methane and halogenated hydrocarbons, and a third surface or cold adsorbent covered panel to adsorb helium, hydrogen and neon.

4,593,531

ABSORPTION COOLING AND HEATING APPARATUS AND METHOD

Masakazu Fujimoto, Tokyo, Japan, assignor to Ebara Corporation, Japan

Filed Jan. 15, 1985, Ser. No. 691,540
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—101 **22 Claims**

1. In an absorption cooling and heating apparatus, comprising

generator means for evaporating a refrigerant liquid from a solution therewithin to form a refrigerant vapor,

condenser means for condensing the refrigerant vapor formed by the generator means,

evaporator means which receives the condensed refrigerant from the condenser means and evaporates the same to form refrigerant vapor therewithin,

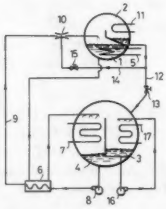
absorber means for absorbing the refrigerant vapor formed by the evaporator means, and which receives a concentrated solution from the generator means and passes a dilute solution to the generator means,

heat exchanger means for effecting heat exchange between the concentrated solution and the dilute solution, and

switching means for alternately changing to a cooling or to a heating operation,

the improvement comprising

means for mixing at least a portion of the condensed refrigerant condensed by the condenser means with the dilute solution passed through the heat exchanger means before the dilute solution is supplied to the generator means, in conjunction with operation of the switching means.



18. A method for alternative effecting of heating and cooling, comprising the steps of

evaporating refrigerant to form first refrigerant vapor from a solution within generator means, to thereby form a concentrated solution therewithin,

condensing the first refrigerant vapor,

evaporating the condensed refrigerant to form second refrigerant vapor and to release energy for cooling, during a cooling operation,

absorbing the second refrigerant vapor into the concentrated solution received from the generator means, to form a dilute solution,

transferring heat from the concentrated solution formed within the generator means, to the thus-formed dilute solution,

directing the thus-formed and heated dilute solution into the generator means, and

switching from the cooling operation to a heating operation, by mixing at least a portion of the thus-condensed refrigerant condensed by the condenser means, with the thus-formed dilute solution, prior to introduction of the thus-formed dilute solution into the generator means.

4,593,532
EVAPORATION-COOLED GAS INSULATED ELECTRICAL APPARATUS

Minoru Kimura, Takarazuka, and Michitada Endo, Suita, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 8, 1984, Ser. No. 669,327

Claims priority, application Japan, Nov. 10, 1983, 58-209806

Int. Cl.[4] F25D *19/00*

U.S. Cl. 62—119 **5 Claims**

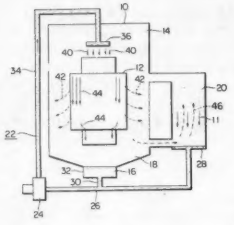
1. An evaporation-cooled gas insulated electrical apparatus comprising in a housing:

an electrical device generating heat when in operation;

a condensable refrigerant convertible between liquid and vapor phases; and

a noncondensable, electrically insulating gas;

said condensable refrigerant and said noncondensable gas being selected so that the ratio V_g/V_l of the gas phase volume V_g and the liquid phase volume V_l is between 1 and 10, and so that the specific weight of the noncondensable gas is smaller than the specific weight of the vapor of the condensable refrigerant during operation, and so that said noncondensable gas and said condensable refrigerant



vapor are separated due to the difference in their specific weights;

said noncondensable gas being a mixture of two noncondensable gases, one of the mixed gases having a very small solubility into the condensable refrigerant as compared to that of the other mixed gas; and

said condensable refrigerant being a fluorocarbon liquid having a boiling point between 80° C. and 160° C. and a mean molecular weight of between 180 and 700.

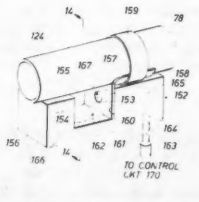
4,593,533
METHOD AND APPARATUS FOR DETECTING AND CONTROLLING THE FORMATION OF ICE OR FROST

Richard H. Alsenz, 2402 Creekmeadows, Missouri City, Tex. 77459

Continuation of Ser. No. 529,728, Dec. 5, 1974, abandoned. This application Oct. 28, 1977, Ser. No. 846,573

Int. Cl.[4] F25D *21/02;* **G08B** *19/02*

U.S. Cl. 62—140 **18 Claims**



1. An improved apparatus for more consistent and sensitive detection of ice or frost accumulation on a refrigerator evaporator coil chracterized by passing electromagnetic radiation through ice or frost accumulated on the evaporator coil, detecting changes in the intensity of the electromagnetic radiation passing through the frost and initiating a defrost cycle in response to the detected changes in the electromagnetic radiation intensity, the improvement comprising:

(a) a radiation means for reducing ambient radiation variation effects and increasing thermal and voltage stability by directing at said frost, electromagnetic radiation of a narrow band of wavelengths selected from the absorption and scattering spectrum of said frost and having a bandwidth substantially equivalent to the bandwidth of the electromagnetic radiation emitted by electrons traversing the energy gap of a semiconductor device;

(b) a detection means for detecting the change in intensity of said electromagnetic radiation due to scattering and absorption from the frost;

(c) a body member supporting said radiation means and said detection means in a spaced-apart relationship;

(d) a mounting means adapted for mounting said body member adjacent to said evaporator coil for detecting decreases in intensity of said electromagnetic radiation in response to increases in frost accumulation thereon; and

(e) a frost forming member interposed between said radiation means and said detection means for accumulating frost thereon directly proportional to the frost accumulation on the evaporator coil and permitting substantially unhindered transmission of said electromagetic radiation when no frost is present thereon.

4,593,534

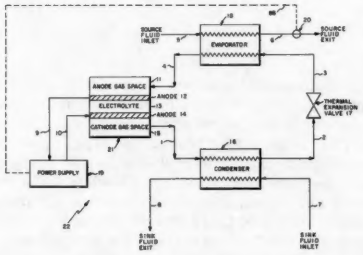
ELECTROCHEMICALLY DRIVEN HEAT PUMP

David P. Bloomfield, Boston, Mass., assignor to Analytic Power Corporation, Boston, Mass.

Filed Feb. 21, 1985, Ser. No. 703,865

Int. Cl.[4] F04B *37/02*; F04F *11/00*

U.S. Cl. 62—201 **9 Claims**



1. A refrigeration cycle which conveys heat from a first heat reservior at low temperature to a second heat reservoir at high temperature comprising:

an electrochemical compressor including a plurality of electrochemical cells electrically connected in series through a power supply, each cell comprising a cathode electrode, an anode electrode, a solid electrolyte disposed therebetween, a cathode gas space on the nonelectrolyte side of said cathode electrode and an anode gas space on the nonelectrolyte side of said anode electrode;

a working fluid at least one component of which is electrochemically active and one component of which is condensable;

a first heat transfer means for cooling of the working fluid;

expansion means for reducing the pressure of the working fluid;

a second heat transfer means for heating the working fluid;

means for delivering working fluid from the said electrochemical compressor to the said first heat transfer means;

means for delivering the working fluid from the said first heat transfer means to the said expansion means;

means for delivering the working fluid from the said expansion means to the said second heat transfer means;

means for delivering the working fluid from the said second heat transfer means to the said electrochemical compressor;

temperature control means operably connected to the heat reservoirs;

temperature control means operably connected to the working fluid.

4,593,535

DIFFERENTIAL PRESSURE VALVE

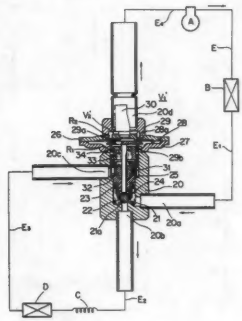
Tadaaki Ikeda, Sayama; Masakazu Kitamura, Hidakamachi, and Tomoo Okada, Sakado, all of Japan, assignors to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,877

Claims priority, application Japan, Dec. 28, 1983, 58-245325; Aug. 16, 1984, 59-124384[U]

Int. Cl.[4] F25B *41/04*

U.S. Cl. 62—217 **4 Claims**



1. A differential pressure valve used in a refrigerating circuit providing refrigerant flow path starting from a rotary compressor, passing through a condenser, an evaporator, and back to said rotary compressor comprising

valve body means having a first inlet communicating with a condenser, a first outlet communicating with an evaporator, a second inlet communicating with the evaporator and a second outlet communicating with a rotary compressor; said first inlet and first outlet normally communicating with each other, said second inlet and second outlet normally communicating with each other;

valve means provided between said first inlet and first outlet;

a diaphragm extended between said second inlet and said second outlet, said diaphragm having a center hole;

a check valve attached to the diaphragm at said center hole;

a valve rod having a first end in abutment against said diaphragm on an inlet side thereof and a second end in abutment against said valve means, said valve means normally urged to provided the communication between said first inlet and said first outlet.

4,593,536

CARBON DIOXIDE REFRIGERATION SYSTEM

James K. Fink, White Bear Lake, Minn., and David H. Habel, Spring Hill, Kans., assignors to Burlington Northern Railroad Company, St. Paul, Minn.

Filed Jun. 21, 1985, Ser. No. 747,405

Int. Cl.[4] B60H *3/04*

U.S. Cl. 62—239 **13 Claims**

1. A refrigerated transporation vehicle comprising:

(a) ceiling, floor, two end and first and second sidewalls cooperatively connected to form an enclosed storage area;

(b) means for containing solid refrigerant flakes, said containing means positioned proximate said ceiling and extending substantially the entire length of said vehicle;

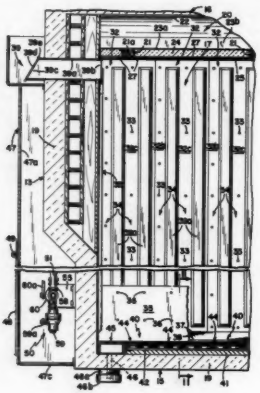
(c) means for providing transfer of liquid CO_2 to said containing means and means for converting the liquid CO_2 into the solid refrigerant flakes and directing the flakes into said containing means;

(d) means for allowing vapor, when the solid refrigerant flakes sublimate, to exit said containment means to said storage area, said exit means positioned proximate said

first sidewall said exit means comprising a plurality of openings extending along said containing means;

(e) said sidewalls having means for channeling a flow of air, including said vapor; and

(f) said floor having means for directing the flow of air from said first sidewall to said second sidewall, wherein when



said refrigerant flakes sublimate in said containing means, said vapor flows from said containing means out said exit means, vertically down said channel means of said first sidewall, across said directing means and vertically up said channel means of said second sidewall, all by convection, whereby no moving parts are required to effect refrigeration of said vehicle during transit.

4,593,537

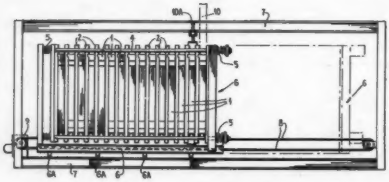
VERTICAL PLATE FREEZER APPARATUS

Klaas Visser, P.O. Box 588, Bendigo, Victoria 3550, Australia

Filed May 25, 1984, Ser. No. 614,018

Int. Cl.[4] A23G *9/00*

U.S. Cl. 62—345 **28 Claims**



1. Plate freezer apparatus comprising a plurality of juxtaposed, substantially vertically disposed freezer plates, each adjacent pair of plates defining a freezing space therebetween, spacer means maintaining a predetermined minimum spacing between each adjacent pair of plates, compression means to hold the plurality of freezer plates and spacer means in assembled relationship as a plate and spacer assembly and plate separation means for selectively separating the plates of a selected pair to faciliatate removal of frozen material from the freezing space defined by the selected pair of plates, wherein said compression means includes two or more tension members extending the length of the plate and spacer assembly, one end of each tension member being operatively engaged with an end of said plates and the other end of each tension member having compression spring means to apply pressure to the opposite end plate whereby the compression spring means acts to apply a compressive force to the plate and spacer means assembly.

4,593,538

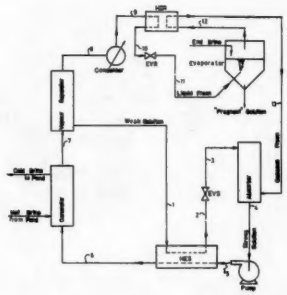
REFRIGERATION CYCLE OPERATABLE BY LOW THERMAL POTENTIAL ENERGY SOURCES

Irena Borde, and Yitzhak Yaron , both of Beer Sheva, Israel, assignors to Ben-Gurion University of the Negev Research and Development Authority, Beer Sheva, Israel

Filed Sep. 21, 1984, Ser. No. 653,080

Int. Cl.[4] F25B *15/10*

U.S. Cl. 62—490 **7 Claims**



1. An absorption-refrigeration system comprising:

a volatile refrigerant selected from the group consisting of fluoro- and fluoro-chloro-hydrocarbons;

an absorbent consisting essentially of an organic polar solvent possessing a strong chemical affinity for said refrigerant;

means, comprising a generator having a solution of said refrigerant in said solvent therein for vaporizing said refrigerant from said solution by heat exchange with a source of thermal energy, said solution and said thermal energy source being partners defining a first heat-exchange partner pair;

means for condensing said refrigerant to form a refrigerant, vapor by heat exchange with a substance to be refrigerated said refrigerant vapor and said substance to be refrigerated being partners defining a second heat-exchange partner-pair;

absorbing means for dissolving said refrigerant vapor in said absorbent to reform said solution; and

means, for continuously circulating said solution through said generator including means for recycling said reformed solution to said generator;

at least one of said first and second heat-exchange partner-pairs comprising mutually non-reactive and immiscible partners; and

at least one of said generator means and said evaporating means including means for direct heat exchange between said at least one heat-exchange partner-pair.

4,593,539

EVAPORATOR, IN PARTICULAR FOR AUTOMOTIVE AIR CONDITIONING SYSTEMS

Bohumil Humpolik, Ludwigsburg; Hans-Joachim Ingelmann, Iggingen-Schoenhardt, and Karl-Heinz Staffa, Stuttgart, all of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Apr. 3, 1985, Ser. No. 719,462

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413931

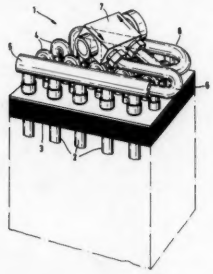
Int. Cl.[4] F25B *39/02*

U.S. Cl. 62—504 **16 Claims**

1. An evaporator for air conditioning installations in automotive vehicles, comprising:

an evaporator block including a plurality of evaporator tubes; and

a coolant supply means including an expansion valve for producing a mixed phase gas-liquid coolant medium, a feed tube connected to the outlet of said expansion valve and having a configuration which produces at least some separation of the gas and liquid coolant phases, and a manifold connected between said feed tube and said evaporator tubes to distribute coolant to said evaporator tubes,



wherein said manifold comprises means, including a calming line segment of sufficient length disposed within the manifold for providing uniform mass flow of the mixed phase coolant over the cross section of the calming line segment, a distributing chamber downstream of the calming line segment for distributing the flow of coolant from the calming line segment to said evaporate tubes, and means for deflecting the flow of coolant, disposed between the calming line segment and the distributing chamber.

4,593,540

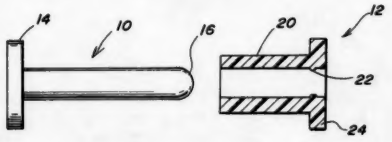
PIERCED EARRING WITH SLIDABLE PLASTIC POST AND BACKING

Christina L. Cuvar, and Robert P. Cuvar, both of RR 1, Box 462, Bunker Hill, Ill. 62014

Filed Jan. 31, 1985, Ser. No. 697,225

Int. Cl.[4] A44C *7/00*

U.S. Cl. 63—12 **6 Claims**



1. An earring comprising a pliable plastic post to go inwardly through the hole in a pierced ear hole and a pliable plastic and reversible clutch with an insertion hole running the length and open at opposite ends thereof and having a reduced diameter therealong for frictional engagement of the post, said post being longer than the combined length of the hole in the ear lobe and length of the insertion hole in the clutch such that in use the free end of the post overhangs the clutch.

4,593,541

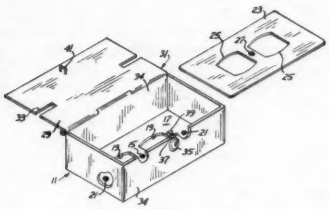
LOCKING ELECTRICAL OUTLET BOX

Nathaniel Hollis, 239 Highland, Highland Park, Mich. 48203

Filed May 7, 1984, Ser. No. 607,771

Int. Cl.[4] E05B *65/00*

U.S. Cl. 70—57 **3 Claims**



1. A locking electrical outlet box positionable over a pair of electrical wall outlets having an apertured face plate secured to a wall;

said box including side walls and a bottom wall having a pair of outlet clearance apertures and fastener apertures for anchoring the box and face plate upon the wall, and the face plate upon said bottom wall;

and a cover along one edge hinged to a side wall and having a pair of spaced aligned outwardly opening slots adapted to receive an electrical cord of an appliance terminating in a plug positioned within said box and registerable within a wall outlet;

a key lock nested and anchored upon a side wall including a rotatable latch positioned within said box;

and an apertured latch bar depending from said cover within said box for interlock with said latch.

4,593,542

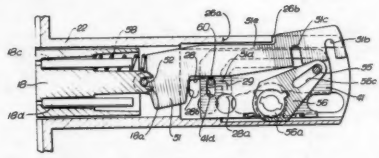
DEADBOLT ASSEMBLY HAVING SELECTABLE BACKSET DISTANCE

Anthony J. Rotondi, Whittier; Richard O. Mullich, Burbank, and George F. Carabet, Rancho Palos Verdes, all of Calif., assignors to TRE Corporation, Los Angeles, Calif.

Filed Jul. 29, 1983, Ser. No. 518,448

Int. Cl.[4] E05B *63/06*

U.S. Cl. 70—134 **11 Claims**



1. A deadbolt lockset having a selectable backset distance comprising:

a hollow latch case assembly;

a deadbolt slidably carried within the latch case assembly and moveable between an extended and a retracted position;

actuator means for extending and retracting the deadbolt;

a deadbolt extension slidably carried within the latch case assembly and coupled at one end to the deadbolt, the other end of the deadbolt extension including first and second spaced openings;

coupling means for coupling the actuator means to the deadbolt extension; and

adjustment means for guiding the actuator means from a first location within the latch case in which the coupling means is coupled to the first deadbolt extension opening to provide a

first backset distance to a second location within the latch case in which the coupling means is coupled to the second deadbolt extension opening to provide a second backset distance, wherein at each of the first and second locations the actuator means is operable to extend or retract the deadbolt, and

wherein the latch case assembly includes a pair of backset control slots disposed opposite each other on either side of the latch case and wherein the adjustment means includes a pin coupled to the actuator assembly, wherein said pin passes through the backset control slots and extends from each side of the latch case assembly, wherein movement of the pin within the slots changes the backset distance.

4,593,543

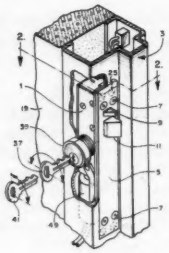
SECURITY LOCK

Ronald T. Stefanek, Lockport, Ill., assignor to Folger Adam Company, Lemont, Ill.

Filed Oct. 5, 1983, Ser. No. 539,331

Int. Cl.[4] E05B *65/06*

U.S. Cl. 70—134 **74 Claims**



1. A security lock for locking and unlocking a door with respect to a doorjamb, comprising:

a housing;

bolt means slidingly supported within said housing for extending outside the housing to lock said door with respect to said jamb and for retracting within said housing to unlock the door and jamb; and

deadlocking means pivotally supported at a pivot point for movement between a locking position for blocking retracting movement of the bolt means to lock the door and an unlocking position for allowing the bolt means to be retracted within the housing to unlock the door, the deadlocking means including a front blocking portion and a rear blocking portion positioned on opposite sides of said pivot point, said front and rear blocking portions having means for jointly blocking retracting movement of said bolt means.

4,593,544

CENTRAL LOCKING SYSTEM WITH TWO-DOOR CONTROL FOR MOTOR VEHICLES

Klaus Claar, Freudenstadt; Klaus-Juergen Heimbrodt, Boeblingen, and Hermann Kurth, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

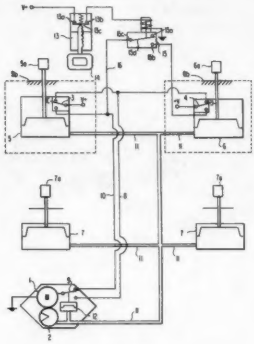
Filed Dec. 6, 1982, Ser. No. 447,100

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149071

Int. Cl.[4] E05B *65/36*

U.S. Cl. 70—264 **3 Claims**

1. In a central locking system with two-door control for motor vehicles having a starting switch, respective interior actuating means on a driver side and a passenger side, a driver door, a passenger door, and a key for said starting switch, and in which certain locking operations are precluded in dependence on the presence of the key of the starting switch, wherein the improvement comprises key sensing means for sensing the presence or absence of said key in said starting switch, enabling menas responsive to the presence of said key to enable a locking actuation of the central locking system exclusively by way of said interior actuating means on the driver side, disabling means also responsive to the presence of said key to disable a locking actuation of the central locking



system on the passenger side and to permit a mechanical locking only of the passenger door by way of the interior actuating means on the passenger side, and central locking enabling means responsive to the absence of said key to enable a locking actuation of the central locking system by way of each interior actuating means on the driver and passenger sides.

4,593,545

LEVER LOCK SAFETY DEVICE

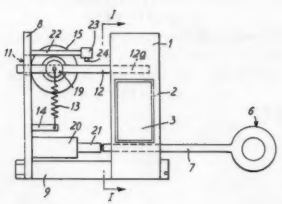
Edmund A. Terry, Barking; Albert J. Burger, Bromley, and Peter A. Terry, Hornchurch, all of United Kingdom, assignors to P. A. Terry Limited, London, England

Filed Oct. 28, 1983, Ser. No. 546,386

Claims priority, application United Kingdom, Oct. 28, 1982, 8230868; Apr. 7, 1983, 8309443

Int. Cl.[4] E05B *43/00*

U.S. Cl. 70—269 **8 Claims**



1. In a key-operable lock having a movable bolt which is retained in its locking position by at least one movable locking member engaging the bolt but movable by rotation of a coacting key-bit of the key to release the bolt for movement to an unlocking position, the improvement wherein the lock further comprises a latching bar movable along a guide extending laterally of the bar between a latching position, in which the latching bar extends across the path of movement of the locking member to act as an abutment preventing movement of the locking member from its locking position to release the bolt, and an unlatching position; latch-control means acting on the latching bar to move said bar from its latching position to its unlatching position; switch means operable by movement of the key in the lock; and a timer actuated by the switch means

and acting on the latch-control means to cause movement of the latching bar from its latching position to its unlatching position after a delay following operation of the switch means.

4,593,546

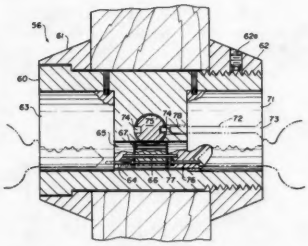
HIGH SECURITY CYLINDER OPERATED DEADBOLT LOCK

Mark L. Allen, 1776 E. 13th St., Brooklyn, N.Y. 11229

Continuation of Ser. No. 419,808, Sep. 20, 1982, abandoned. This application Dec. 26, 1984, Ser. No. 685,222

Int. Cl.[4] E05B *9/10*

U.S. Cl. 70—380 **1 Claim**



1. A high security door lock comprising: a lock housing consisting of a solid cylindrical member having an outwardly projecting rim at one end thereof, said rim providing an external shoulder spaced from said one end, the other end of said cylindrical member being threaded so that a flange means can be threaded onto said cylindrical member, said cylindrical member being provided at said one end with an axial bore having a depth substantially equal to the longitudinal length of a lock cylinder, a second longitudinal bore extending from the bottom of said axial bore to said other end of said cylindrical member, said second bore including a small diameter section and a larger diameter axial section having a depth substantially equal to the longitudinal length of a lock cylinder, a bolt receiving bore intersecting said small diameter section of said second bore and extending transversely through said cylindrical member so that a bolt can be inserted therein from either side of said cylindrical member; bolt driving pinion means rotatably mounted in said small diameter section of said second bore, said pinion means being provided with an eccentrically positioned bore extending longitudinally through said pinion means; lock cylinder means positioned in said first bore so as to be substantially flush with said one end of said cylindrical member and to substantially fill said first bore, said lock cylinder means being provided with a bolt moving member extending into said small diameter section of said second bore and including eccentrically mounted pin means slidably biased into driving engagement with said pinion means; a solid bolt slidably positioned in said bolt receiving bore and provided with a rack section that engages said pinion means, said bolt when driven to a locking positon remaining in engagement with said bolt driving pinion means and in said bolt receiving bore so as to prevent said cylindrical member being rotated in a door in which it is installed; second lock cylinder means positioned in said larger diameter section of said second bore so as to substantially fill said larger diameter section and to be substantially flush with said other end of said cylindrical member, said second lock cylinder means being provided with a bolt moving member extending into said small diameter section of said second bore and including eccentric pin means slidably mounted for movement into and out of driving engagement with said pinion means; connecting pin means slidably positioned in said eccentrically positioned bore in said pinion means and aligned with the eccentrically mounted pins of the bolt moving members of said lock cylinders, the arrangement being such that said biased pin of said lock cylinder causes said connecting pin means to push said eccentrically mounted pin of said second lock cylinder means out of driving engagement with said pinion means, the arrangement being further such that the eccentrically mounted pin of said second lock cylinder means can be moved by a key inserted into said second lock cylinder means into driving engagement with said pinion means, such movement causing said connecting pin means to push biased eccentrically mounted pin of said lock cylinder means out of driving engagement with said pinion means; an annular collar member having an internal shoulder and adapted to slide over said cylindrical member so that when the shoulder of said collar member abuts the shoulder of said cylindrical member the end of said collar member is flush with said one end of said cylindrical member and can rotate freely thereon; and flange means threaded onto the threaded end of said cylindrical member to engage the inner side of a door in which the lock is installed.

4,593,547

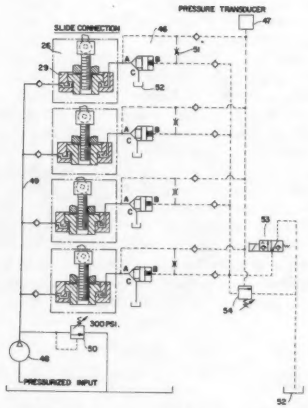
HYDRAULIC OVERLOAD CONTROL SYSTEM FOR POWER PRESSES

Francis E. Heiberger, Elmhurst, Ill., assignor to Danly Machine Corporation, Chicago, Ill.

Filed Jun. 26, 1985, Ser. No. 748,971

Int. Cl.[4] B21D *55/00*

U.S. Cl. 72—1 **16 Claims**



1. In a mechanical power press having a flywheel driven shaft and an eccentric fixed thereto, a pitman drivingly connected to said eccentric, a slide drivingly connected to said pitman, a die connected with said slide, and a clutch and brake interlock mechanism for arresting movement of said slide, the improvement comprising, in combination:

means for generating a first electrical signal having a value proportional to the force exerted on said die by said slide throughout the work stroke,

means for generating a second electrical signal having a value proportional to the position of said slide throughout the work stroke,

means for storing the maximum tonnage capacity values of the press at a multiplicity of slide positions throughout the work stroke,

control means responsive to said second signal for retrieving the stored value representing the maximum tonnage capacity of the press at the slide position represented by said second signal,

means for comparing said retrieved value with said value of first signal to determine whether the press is in an overload condition, and

means responsive to the determination of an overload condi-

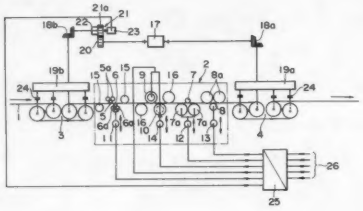
tion at any point in the work stroke for actuating said clutch and brake interlock mechanism to stop movement of said slide.

4,593,548

METHOD OF CORRECTING DISTORTIONS IN A ROLLED STRIP PRODUCT

Kazuyoshi Hashimoto; Toshihiro Takemasa, and Nobuyuki Taniguchi, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1985, Ser. No. 749,227
Claims priority, application Japan, Jul. 6, 1984, 59-138980
Int. Cl.[4] B21B *37/00*
U.S. Cl. 72—12 **2 Claims**



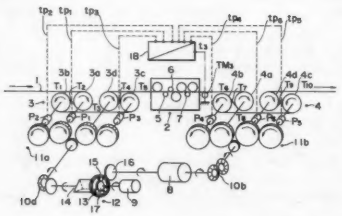
1. A method of correcting distortions existing in a rolled strip product by using a tension leveling equipment including a leveling mill station for smoothing out distortions remained in the strip product by producing a permanent elongation through the repetition of bending procedures rendered upon the strip while passing under tension therethrough, a pair of bridle units disposed on the both input and output sides of said leveling mill station, and means for rendering a tension upon the strip from a predetermined rate of elongation under the effect of a difference in the feeding velocities of said bridle units, which comprises the steps of detecting the distortions in the shape of said strip product upon the delivery thereof from said output bridle unit, obtaining detection signals, and controlling the rate of intermeshing in said leveling mill station and the rate of elongation of said strip product to a required range in accordance with said detection signals.

4,593,549

METHOD OF CONTROLLING A TENSION LEVELLING EQUIPMENT

Muneo Moriya; Toshihiro Takemasa, and Keiichi Katayama, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,625
Claims priority, application Japan, Jul. 10, 1984, 59-141417
Int. Cl.[4] B21B *37/00*
U.S. Cl. 72—12 **2 Claims**



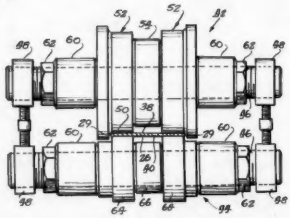
1. A method of controlling a tension levelling equipment for correcting residual distortions in an extension of strip including a series of input and output bridle roll means for rendering a tension upon said extension of strip extending between the input and output sides of a levelling mill station for smoothing out the distortion, and slipping clutch means connecting said bridle roll means with driving means allowing a slipping motion therebetween, which comprises the steps of measuring a current tension rendered upon said extension of strip at the both input and output sides of either of said input and output bridle roll means, and controlling the engaging torques of said slipping clutches in such a manner that a current slipping motion produced between said extension of strip and said bridle roll means may be nullified or eliminated according to the result of measurement of tensions.

4,593,550

STRIP PREPARATION ROLLERS

Lucid L. Byrd, Palos Park, Ill., assignor to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Jul. 15, 1985, Ser. No. 755,499
Int. Cl.[4] B21B *1/08, 27/00*
U.S. Cl. 72—199 **8 Claims**



1. An improvement in a continuous rolling mill for forming flat steel strip into tubing, said strip having a first surface and a second surface with said first surface becoming the inside surface of said tubing and said second surface becoming the outside surface of said tubing, said strip having lateral edges with irregularities at the edges adjacent said first surface due to cutting of said strip from a wide strip, said improvement comprising:

a strip preparation station for cold working the strip edges to form bevels on said edges at said first surface, said strip preparation station comprising:

an upper roller means including a pair of upper end working rollers rotatably mounted on an upper, substantially horizontally extending shaft;

a lower roller means, aligned with said upper roller means and spaced therefrom throughout their coextension, including a pair of lower end rollers rotatably mounted on a lower, substantially horizontally extending shaft, said upper and lower shafts being disposed in a common vertical plane;

said upper end working rollers and said lower end rollers defining a pass path for said strip, each of said lower end rollers having a support surface for engaging the second surface of said strip and an outer pocket with a lower transition surface extending intermediate said support surface and said outer pocket,

each of said upper end rollers having an upper engagement surface for contacting the first surface of said strip and an outer flange which terminates below the level of said support surface and extends into said pocket, each upper end roller having a bevelled working surface adjoining said engagement surface and overlying at least a portion of said transition surface and a portion of said support surface for cold working the irregularities of said strip whereby said strip edges are coined so that, when said edges are brought together to form said tubing, a groove is formed on the inside surface thereof to receive a bead formed by induction welding.

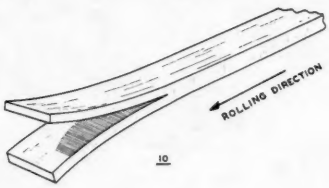
4,593,551
ROLLING PROCEDURES FOR ALLIGATOR DEFECT ELIMINATION

William L. Otto, Jr., Allegheny Township, Allegheny County; Neal L. Lawson, Monroeville, and Howard A. Kuhn, Richland Township, Lebanon County, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 532,705, Sep. 16, 1983, abandoned. This application Oct. 5, 1984, Ser. No. 658,157

Int. Cl.[4] B21B *31/20*

U.S. Cl. 72—240 **2 Claims**



1. A method of reducing the thickness of a slab of metal in a rolling mill without causing alligatoring in the end of the slab entering the mill, alligatoring being the result of certain combinations of entry thickness and reduction of thickness, the reduction process requiring multiple reductions in thickness of the slab during respective multiple passes of the slab through the mill, the method comprising the steps of:

determining before each pass of a slab a combination of entry thickness and thickness reduction therefor that is not subject to alligatoring,

providing the slab with an end portion that has such a combination, the combination being effected by tapering the end portion before each pass,

leaving the remaining portion of the slab untapered,

directing each tapered portion into the mill for each reduction in thickness,

reducing the thickness of each slab in a manner such that the tapered portion passes though the mill before a combination of entry and reduction thickness occurs that can cause alligatoring,

reducing in thickness the remaining untapered portion of the slab with each pass, and

completing each pass without the occurrence of alligatoring and until the combination of entry and reduction thickness is not subject to alligatoring, at which time the tapering of the slab end for each pass becomes unnecessary.

4,593,552
BUTT SHEAR WITH BUTT KNOCKER

Helmut B. Huertgen, Pittsburgh, Pa., assignor to Sutton Engineering Co., Pittsburgh, Pa.

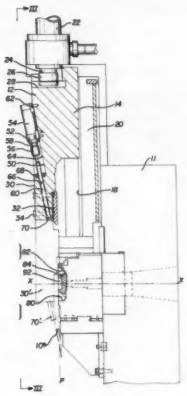
Filed Jun. 12, 1985, Ser. No. 744,048

Int. Cl.[4] B21C *35/04*

U.S. Cl. 72—255 **16 Claims**

1. In an extrusion press wherein a butt dislodging means is provided with a shear blade that is movable with respect to the extrusion axis of the press along a shear plane to shear the butt of a metal billet from the face of an extrusion die subsequent to an extrusion operation, the improvement in said butt dislodging means comprising:

a selectively operable butt knockoff means which is movable in unison with said shear blade wherein said knockoff means includes a knockoff member which is carried in a manner to be extendable with respect to said shear blade



along a line of motion which passes in proximity to said shear blade and converges with said shear plane.

4,593,553
METHOD FOR DETECTING ENGINE KNOCK IN INTERNAL COMBUSTION ENGINES

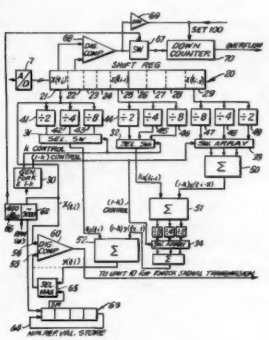
Jörg Bonitz, Mühlacker; Robert Entemann, Benningen; Bernhard Miller, Stuttgart; Siegfried Rohde, Schwieberdingen; Stefan Unland, Ludwigsburg, and Walter Viess, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 587,996

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308541

Int. Cl.[4] G01L *23/22*

U.S. Cl. 73—35 **7 Claims**



1. Method of reliable and early detection of knocking in a multi-cylinder internal combustion engine by sensing, filtering and demodulating an audio frequency signal representing engine vibrations and integrating said signal during crankshaft-timed window periods, converting the resulting integrated signal from analog to digital form and then comparing the integrated digital signal with a reference signal obtained by recursive digital filtering of a succession of integrated digital signals relating to the same engine cylinder as the signal compared with said reference signal, said digital filtering being performed by applying a weighting factor k and its comple-

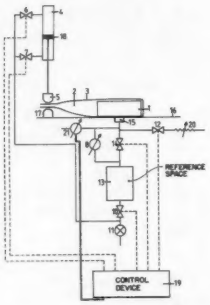
ment respectively to at least one pair of said successive integrated digital signals, said method further comprising the step of:

providing said factor k and its complement (1−k) in a manner dependent on acceleration of engine speed.

4,593,554
LEAK DETECTION

Mathias L. C. Aarts, Bilthoven, Netherlands, assignor to Product Suppliers AG, Switzerland

Filed Feb. 4, 1985, Ser. No. 698,040
Claims priority, application Netherlands, Feb. 8, 1984, 8400398
Int. Cl.⁴ G01M *3/34*
U.S. Cl. 73—49.3 **16 Claims**



10. An apparatus for detecting a leak in a vacuum package, comprising:

wrapping means for receiving and tightly wrapping the said vacuum package, said wrapping means consisting at least essentially of a wrapping foil or sheet of flexible, gas-tight material,

means for forcibly pressing said wrapping foil against said vacuum package when the vacuum package has been applied in said wrapping means,

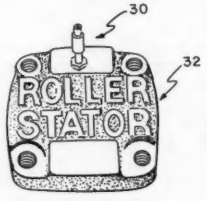
means for detecting a pressure drop in the remaining residual space between the said vacuum package and the said wrapping means after forcibly pressing the said sheet of material against the vacuum package,

means for hermetically sealing the said residual space from the atmosphere.

4,593,555
SPEED AND TORQUE SENSOR FOR HYDRAULIC MOTOR

Gary W. Krutz, 605 Northridge Pl., West Lafayette, Ind. 47906, and Mark Evans, College Station, Tex., assignors to Gary W. Krutz, West Lafayette, Ind.

Filed Dec. 16, 1983, Ser. No. 562,436
Int. Cl.⁴ G01L *3/26*
U.S. Cl. 73—116 **10 Claims**

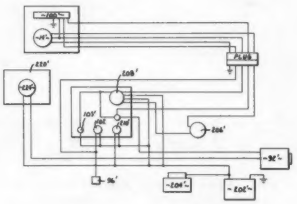


1. An apparatus for determining an operating parameter of a fluid motor comprising a motor housing having a deflectable housing wall region, the deflectable housing wall region deflecting in response to stress applied to the deflectable housing wall region from within the motor as the motor operates, and means for detecting the resulting strain on the deflectable housing wall region, and for producing a signal indicative of the occurrence and amount of the strain.

4,593,556
TESTER FOR LOCK UP TORQUE CONVERTERS

James R. Wehr, 3534 Cara La., Springfield, Mo. 65802

Filed Nov. 14, 1984, Ser. No. 671,438
Int. Cl.⁴ G01M *19/00*
U.S. Cl. 73—118 **5 Claims**



4. A control system for testing a lock-up mechanism of a torque converter of a vehicle transmission having input and output shafts operated by rotation of a drive shaft of a powered prime mover, said torque converter providing a fluid coupling of the drive shaft to an input shaft of said transmission with said lock-up mechanism mechanically coupling said drive and input shafts, said control system comprising:

a current-producing electrical system energized by operation of said prime mover;

an electric clock;

circuitry for simultaneously directing current from said electrical system to said clock and to said lock-up mechanism to simultaneously initiate operation of said clock and said lock-up mechanism;

cutoff means for ceasing operation of said clock upon said lock-up mechanism coupling said drive shaft with said input shaft;

said clock presenting a time parameter thereon indicative of the time interval between the initial delivery of current to said lock-up mechanism and said coupling, said parameter comparable to a predetermined time parameter corresponding to a desired time interval between initiation of operation of said lock-up mechanism and said coupling, said time parameters indicative of the relative qualtiy of actual operation of said lock-up mechanism of said transmission.

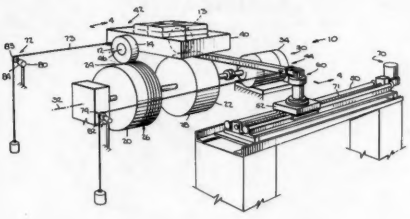
4,593,557
TIRE TESTING APPARATUS

Kenneth L. Oblizajek; Cornelius Lauer, both of Troy, and Eugene H. Culp, Detroit, all of Mich., assignors to Uniroyal Tire Company, Inc., Middlebury, Conn.

Filed Feb. 26, 1985, Ser. No. 705,815
Int. Cl.⁴ G01M *17/02*
U.S. Cl. 73—146 **20 Claims**

20. Apparatus for evaluating the interaction of treads of a test tire with a longitudinally grooved support surface, comprising a first rotatable support drum, said first drum having a plurality of axially spaced, circumferentially continuous strips of abrasive cloth, the spaces between said strips constituting grooves, wherein the circumferential outer edges of said grooves are arcuate in cross-section, said spaces having a width in the range of 1/16 inch to ¼ inch, the centers of said grooves being axially spaced apart from one another by a

distance of between ½ inch and 1 inch; a second rotatable support drum having a smooth outer surface and the same axis of rotation as said first drum; means for rotating said drums about their axis of rotation; vehicle means having an aft portion and a forward portion for coaxially rotatably supporting on said aft portion a test tire and a companion tire, under load, with the tread of the test tire being in rolling engagement with the grooved outer surface of said grooved drum and the tread of the companion tire being in rolling engagement with the smooth outer surface of said smooth-surfaced drum, the rotational axis of said test tire and said companion tire being generally parallel to the axis of rotation of said drums; track means positioned adjacent said forward portion of said vehicle means, said track means being oriented generally parallel to the axes of rotation of said tires and said drums; carriage means slidably carried by said track means; means for selectively slidably moving said carriage means on said track means transversely of



said vehicle means; coupling means pivotally interconnecting said carriage means and said forward portion of said vehicle means for transversely moving the forward portion of said vehicle means in concert with said carriage means and for causing said test tire to move transversely across the grooves of said grooved drum; said coupling means being provided with a thrust bearing to permit said tire support means to swivel horizontally, a first U-joint to permit said tire support means to swivel vertically and a second U-joint to permit said tire support means to partially rotate about its own axis; a first sensing means responsive to the transverse movement of said test tire across the grooves of said grooved drum for providing a signal representative of said transverse movement of said test tire; and a second sensing means responsive to the transverse movement of said forward portion of said tire support means for providing a signal representative of said transverse movement of said forward portion of said tire support means.

4,593,558

METHOD OF OPTIMIZING THE AERODYNAMICS OF A VEHICLE BODY

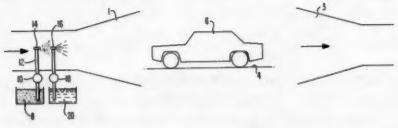
Heiko Barske, Ingolstadt, Fed. Rep. of Germany, assignor to Audi AG, Ingolstadt, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,582

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406718

Int. Cl.⁴ G01M 9/00

U.S. Cl. 73—147 **24 Claims**



1. The method of optimizing the aerodynamic characteristics of a body comprising:

depositing fluid entrainable particles on said body and directing a fluid stream of laminar flow onto said body whereby certain portions of said particles are caused to be displaced in boundary layers of laminar flow of said fluid stream and certain portions of said particles are caused to remain deposited in certain zones adjacent said body, producing a resultant configuration of said body having optimal aerodynamic characteristics.

4,593,559

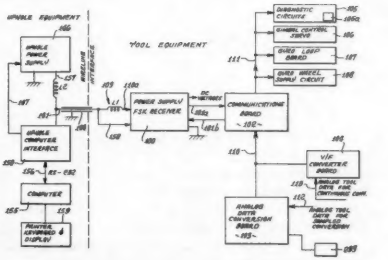
APPARATUS AND METHOD TO COMMUNICATE BIDIRECTIONAL INFORMATION IN A BOREHOLE

David C. Brown, Los Osos; Harold J. Engebretson, Yorba Linda, and Fred L. Watson, Templeton, all of Calif., assignors to Applied Technologies Associates, San Marino, Calif.

Filed Mar. 7, 1985, Ser. No. 709,430

Int. Cl.⁴ E21B 47/022

U.S. Cl. 73—151 **11 Claims**



1. In apparatus used in borehole mapping or surveying and including instrumentation for the determination of borehole azimuth and/or tilt, the combination comprising

(a) means for suspending said instrumentation in the borehole,

(b) said instrumentation operating to generate analog signals in the borehole,

(c) means responsive to reception of said signals for multiplexing said signals and converting same to digital signals, in the borehole,

(d) means responsive to reception of said digital signals for converting said digital signals to digital signal words,

(e) means in the borehole connected to receive said signal words and produce signal versions thereof for transmission to the surface,

(f) a transmission path operatively connected with said (e) means, for transmitting said signal versions upwardly in the borehole,

(g) means for stripping said signal versions off the transmission path at an upper elevation and processing said signal versions to a form usable in determination of borehole azimuth and/or tilt at the level of said instrumentation in the borehole,

(h) means to generate digital command words,

(i) means at an upper location connected to receive said digital command words and produce signal versions thereof for transmission downwardly in the borehole, to said instrumentation,

(j) a transmission path for transmitting said command signals to the survey tool,

(k) means for stripping said command signal versions off the (j) transmission path and processing said signal versions to form usable command words for use by said instrumentation in the borehole to control operating modes and other operating characteristics of said instrumentation.

4,593,560

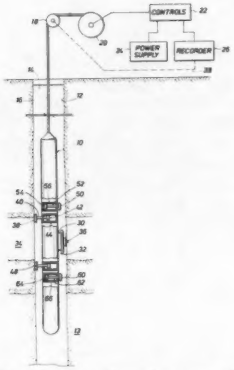
PUSH-OFF PISTONS

Ernest H. Purfurst, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 22, 1985, Ser. No. 725,955

Int. Cl.[4] E21B *49/00*

U.S. Cl. 73—155 **8 Claims**



5. A method of retrieving a formation tester from a well comprising the steps of:

(a) extending a snorkel means laterally from a tool body to conduct formation testing;

(b) sealing adjacent to said snorkel means to isolate borehole pressure from the formation;

(c) positioning upper and lower push-off means above and below said snorkel means on said tool body;

(d) after completing the formation testing, then extending at least one of said push-off means toward the formation to push the tool body away from the formation; and

(e) retrieving the tool body on a logging cable.

4,593,561

FLUID PARAMETER MEASUREMENT SYSTEM

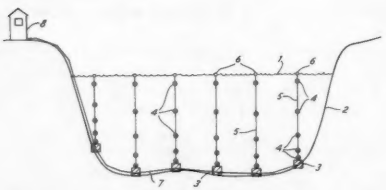
Alexander Gavrilovic, 44 Maunsell Way, Wroughton, Wiltshire SN4 9JE, United Kingdom

Filed Aug. 17, 1984, Ser. No. 641,760

Claims priority, application United Kingdom, Aug. 18, 1983, 8322320

Int. Cl.[4] G01F *1/28*; G01W *1/00*

U.S. Cl. 73—170 A **12 Claims**



1. A fluid parameter measurement system for use in a fluid course comprising a plurality of elongated strings of sensors, each elongated string of sensors including a plurality of sensors spaced apart from another by a fixed interval along the length of the elongated string of sensors and attached thereto, the said string of sensors having a proximal end pivotally attached to an anchoring means on the bed of the course and having a distal end attached to a surface float means whereby each sensor is suspended at a constant proportion of fluid depth, and each of the plurality of strings of sensors is attached to a different one of a plurality of anchoring means, the said anchoring means being located on the bed of the course and spaced apart at fixed intervals in a direction which lies transversely with respect to a normal direction of fluid flow in the course, the arrangement being such that the plurality of sensors lies in a plane extending transversely of the direction of normal fluid flow, thus forming a two-dimensional sensor array for measuring the fluid parameters.

4,593,562

GAS METER

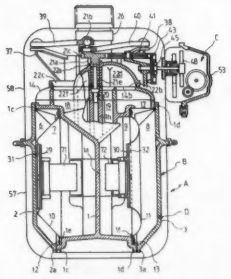
Michel Carte, Reims; Michel Benadassi, Orainville 02190 Guignicourt, and Michel Dumay, Jonchery Sur Vesle, all of France, assignors to FLONIC, Montrouge, France

Filed Jun. 13, 1984, Ser. No. 620,245

Claims priority, application France, Jun. 14, 1983, 83 09791

Int. Cl.[4] G01F *3/20*

U.S. Cl. 73—266 **13 Claims**



1. Gas meter with a measurement unit comprising:

a case made up of a central block, a distribution cover defining a distribution surface equipped with four distribution orifices fixed to said central block and two side covers also fixed to said central block to define two internal compartments;

two deformable bellows each mounted in one of said compartments to separate each compartment into two measurement chambers, said central block moreover forming all four internal passages to connect each distribution orifice to one of said chambers;

a distributor mounted rotatably on said distribution cover and comprising a cylindrical sleeve placed perpendicular to said distribution surface along the axis of rotation of said distributor; and

transmission means comprising a part forming a crank including a hub engaged with clearance in said sleeve and mounted pivotably in relation to said case, and a first pivot shaft parallel to said hub but offset in relation to it, means for connecting said bellows kinematically to said part forming a crank comprising at least two lever assemblies, one end of said lever assemblies being mounted on said first pivot shaft, and means for obtaining the joint rotation of said crank part and said distributor.

4,593,563

PROCEDURE FOR DETERMINING VELOCITY OF DISSOLUTION

Ensio Laine, Rusko, and Jarkko Haapaniemi, Turku, both of Finland, assignors to Labsystems Oy, Helsinki, Finland

Filed Sep. 5, 1984, Ser. No. 647,462

Claims priority, application Finland, Sep. 6, 1983, 833181

Int. Cl.[4] G01N *5/04*

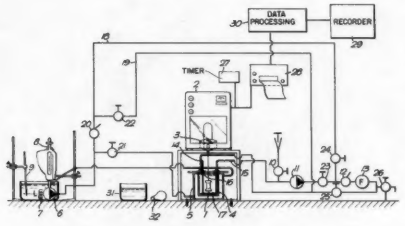
U.S. Cl. 73—432 R **12 Claims**

1. A method for determining the rate of dissolution of a solid in a liquid solvent comprising the steps of:

disposing a sample of said solid in a sample holder with an opening for defining a liquid-solid interface so that a boundary surface of said sample is arranged for contact with said solvent,

mounting said sample holder on means for weighing said sample as a function of time,

immersing said sample holder in a dissolution chamber filled with said solvent so that said boundary surface of said sample is in contact with said solvent,



measuring the weight of said sample as a function of time as said sample dissolves in said liquid, and

varying the internal volume of said sample holder as said sample dissolves so that the area of said boundary surface in contact with said solvent remains substantially constant throughout said step of measuring the weight of said sample as a function of time.

4,593,564

EQUILIBRATING APPARATUS IN PARTICULAR FOR MOTOR VEHICLE WHEELS

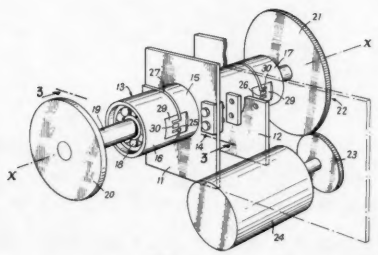
Gerard C. C. Brihier, Arpajon, France, assignor to FACOM, Morangis, France

Filed Feb. 27, 1984, Ser. No. 583,635

Claims priority, application France, Feb. 28, 1983, 83 03272

Int. Cl.[4] G01M *1/16*

U.S. Cl. 73—473 **16 Claims**



1. An equilibrating apparatus for a body adapted to be driven in rotation such as a vehicle wheel, said apparatus comprising a frame, a shaft having an axis of rotation, two bearings in which the shaft is mounted, connecting means for connecting respective said bearings to the frame, said connecting means comprising a pair of resiliently deformable means for connecting each respective bearing to said frame, driving means drivingly connected to the shaft for rotating the shaft at sufficient speed for the equilibration of said body when the body is fixed to an end of the shaft, force measuring detectors fixed to each resiliently deformable means for measuring the imbalance of said body, each pair of said resiliently deformable means extending in a direction parallel to said axis of the shaft and being symmetrical relative to a measuring plane containing said axis of the shaft and in diametrically opposed respective positions relative to said axis of the shaft, each of said resiliently deformable means having a low stiffness in a direction substantially parallel to said measuring plane and a high stiffness in a direction substantially perpendicular to said measuring plane, and said measuring detectors having maximum sensitivity in a direction parallel to said measuring plane so as to permit the elimination of any disturbing force in a direction perpendicular to said measuring plane.

4,593,565

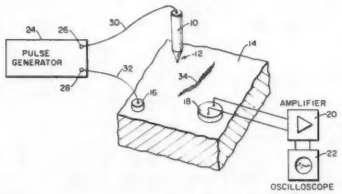
APPARATUS FOR NONDESTRUCTIVE WORKPIECE INSPECTION EMPLOYING THERMOELASTICALLY AND ELECTRODYNAMICALLY INDUCED ELASTIC WAVES

Jacques R. Chamuel, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 8, 1983, Ser. No. 521,325

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—601 **24 Claims**



1. Apparatus for nondestructive inspection of a conductive surface of a workpiece for deep defects comprising:

electrode means removably disposable in contact with said surface of said workpiece at a point of contact to provide at least one resistive current path between said point of contact and said surface, said means providing for electrical conduction therethrough to said surface;

means for electrically energizing said electrode means to thermoelastically induce elastic waves in said surface proximate to said point of contact;

electrode contacting means adapted for contacting said surface, providing for electrical conduction therethrough, and providing a path for return current from said energizing means;

ultrasonic detection transducer means coupled to receive elastic waves impinging said means from any direction along said workpiece surface, said transducer means operative to provide an output signal having specified characteristics and representative of elastic waves induced in said workpiece surface at said electrode means, said elastic waves traversing said workpiece surface and impinging said ultrasonic detection transducer means in the absence of a defect, the presence of a defect in said surface being detectable as a variation in said transducer means output signal characteristics.

7. Apparatus for nondestructive inspection of a workpiece for defects comprising:

an electrical conductor having a predetermined length disposed in close elastic wave transmitting and electrically insulated contact with said workpiece;

means for electrically energizing said conductor with a unitary pulse to induce waves in a volume of said workpiece by thermoelastic effect;

ultrasonic detection transducer means coupled to receive elastic waves impinging upon said transducer means from any direction along said workpiece, said transducer operative to provide an output signal having specified characteristics which are a response to said unitary pulse;

the presence of a defect localized to a portion of said volume in said workpiece being detectable as a variation in said output signal characteristics for said unitary pulse.

14. Apparatus for nondestructive inspection of a workpiece comprising:

at least one elongated electrical conductor disposed in close mechanical, electrically insulating contact with said workpiece along a specified path;

at least one movable local magnetic field generating means disposed proximate to scan said conductor and generating at least one local magnetic field each limited to a small section of said conductor;

means for electrically energizing said conductor and inducing elastic waves in said workpiece solely at said at least one small section electrodynamic effect;

ultrasonic detection transducer means coupled to receive elastic waves from said workpiece, said transducer operative to provide an output signal having specified characteristics;

the presence of a defect in said workpiece being detectable as a variation in said transducer output signal characteristics.

4,593,566

VIBRATION MONITORING IN ROTARY MACHINES

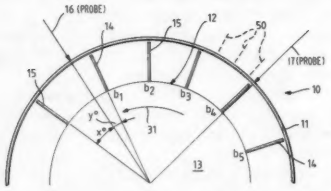
Victor E. H. Ellis, Bristol, England, assignor to Rolls Royce Limited, London, England

Filed Jul. 6, 1984, Ser. No. 628,281

Claims priority, application United Kingdom, Jul. 8, 1983, 8318509

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—660 **8 Claims**



1. A rotary machine comprising:

a rotor;

a plurality of rotor elements circumferentially spaced around the rotor at generally equal spacings;

at least two probes mounted close to the path of portions of said elements which are subject to vibrational motion, the probes being circumferentially spaced from each other by a spacing which is non-integral with the spacing of the elements;

an electrical circuit connected to receive the outputs of the probes, and comprising:

first means providing an output which can change progressively in either of two opposite senses at predetermined rates;

triggering means for causing the output of said first means to commence changing in a first said sense on passage of a said element portion past a first said probe, and subsequently to commence changing in the second said sense on passage of a said element portion past a second said probe; and

output means, which registers the output of the first means on passage of a said element portion past one of the probes, whereby the output from the output means is indicative of vibration of said element portions.

4,593,567

ELECTROMAGNET TRANSDUCER

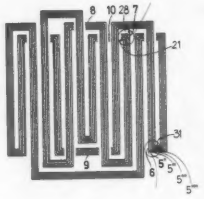
Fritz Isselstein, Meerbusch; Ernst Luhn, Wuppertal; Gunther Coen, Dusseldorf; Dietmar Oberhoff, Wermelskirchen, and Roland Keck, Dusseldorf, all of Fed. Rep. of Germany, assignors to Betriebsforschungsinstitut VDEH Institut for Angewandete Forschung GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,299

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331727

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—643 **12 Claims**



1. An electromagnetic transducer for the transmission and reception of ultrasonic waves in the touchless testing of flat strip and sheet metal by wavelength spectroscopy, comprising:

at least one transducer segment having a plurality of mutually parallel conductor tracks formed on a substantially plane printed circuit board in which the frequencies and wavelengths for each segment are preset in a matrix logic circuit having a short time sequence and in which said conductor tracks include windings operably connected through a set of switching elements to produce in various switching states of said elements a plurality of wavelengths being proportionally related to one another by small integral numbers.

4,593,568

ULTRASONIC INSPECTION OF TUBE TO TUBE PLATE WELDS

David W. Telford, Thurso, and Thomas S. Peat, Halkirk, both of Scotland, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 14, 1985, Ser. No. 691,002

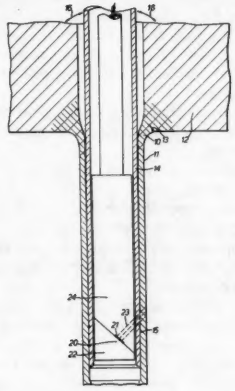
Claims priority, application United Kingdom, Jan. 26, 1984, 8402098

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—623 **10 Claims**

1. A method of inspecting a weld associated with a tube and tube plate assembly in which the tube and a sleeve fit one within the other, the outer one of the sleeve and tube being welded to the tube plate by the weld to be inspected and the sleeve and tube being bonded together at a position spaced axially from the weld, said method being characterised by locating an ultrasonic transducer internally of the sleeve and tube, operating the transducer to couple ultrasound into said outer one of the sleeve and the tube through the bond therebe-

tween whereby the ultrasound propagates along said outer one towards said weld, and analysing the reflected ultrasound



returning along said outer one and via said bond to detect any ultrasound signal components reflected by flaws in said weld.

4,593,569

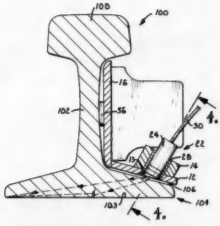
ULTRASONIC TRANSDUCER UNIT TO LOCATE CRACKS IN RAIL BASE

Ivan L. Joy, 4137 Lower Silver Lake Rd., Topeka, Kans. 66618

Filed Aug. 22, 1983, Ser. No. 525,002

Int. Cl.[4] G01N *29/04*

U.S. Cl. 75—636 **20 Claims**



1. Apparatus for use in an ultrasonic determination of defects along the base of a track rail comprising:

a sliding plate positioned on a top surface of said base of a rail;

means for providing relative movement between said sliding plate and said top surface and along the longitudinal extent of said track rail;

a housing mounted to said sliding plate, said housing comprising:

a first compartment for receiving a transducer means therein;

a mounting block for said transducer means positioned in said first compartment;

means for rotating said mounting block about an axis passing therethrough with said rotation variously inclining said transducer means relative to said top surface; and

means for maintaining said rotatable mounting block at a selected position relative to said axis whereby said transducer means is positioned at a selected inclination relative to said top surface;

means for acoustically coupling said mounted housing with said top surface of said rail;

said transducer means being a part of an ultrasonic testing system and mounting in said housing at a selected inclination relative to said top surface of said rail upon rotation of said mounting block;

monitor means associated with said transducer means for checking signals transmitted and received by said transducer,

said transducer means transmitting signals through said top surface of said rail and in a direction along the bottom surface of said rail base and receiving reflected signals resulting from said transmitted signals, said slidable plate movement presenting a succession of positions of said transducer means along the extent of said top surface of said rail base whereby to provide a plurality of transmitted and reflected signals therealong for delivery to said monitor means with said signals being useful in said determination of deflects along the base of a track rail.

4,593,570

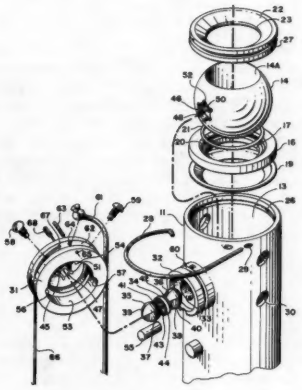
WATER SAMPLER DEVICE WITH KEY

Shale J. Niskin, 3415 Chase Ave., Miami Beach, Fla. 33140

Filed Apr. 1, 1985, Ser. No. 718,552

Int. Cl.[4] G01N *1/10*

U.S. Cl. 73—864.67 **3 Claims**



1. In a water sample collecting device for collecting a water sample having a tubular member with a pair of open end tube portions; valve means mounted at said open end tube portions; said valve means comprising an outer valve seat having a substantially centrally disposed opening, an inner valve seat having a substantially centrally disposed opening, and a ball valve seated between said valve seats and having a substantially centrally disposed opening; said inner valve seats being responsive to the pressure of the water sample collected at a predetermined depth and being slidably positioned in said tubular member; said outer valve seats being mounted at the outer ends of said open end tube portions, a pair of pulley means capable of rotation by predetermined angular amounts, a pair of coupling means for coupling said pulley means to each said ball valve so that rotation of said pulley means rotates said ball valve whereby said openings of said valve seats and said ball valve are in aligned disposition to collect the water sample and subsequently are in non-aligned disposition to contain the water sample, the improvement comprising:

each said coupling means includes a key having a pair of opposed key end portions;

said key end portions having a plurality of key sides with each said key side configured in the shape of a segment of

a cylinder and with adjacent said key sides coming together to define a plurality of curvilinear edges;

each said coupling means includes a pair of cavities formed in said ball valve and said pulley means with each said cavity configured and dimensioned to receive one of said pair of opposed key end portions;

each of said pair of cavities having a plurality of cavity walls; and

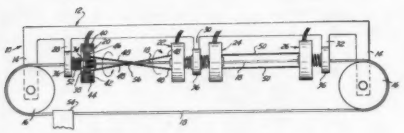
each of said cavities having a plurality of grooves defined therein, wherein one of said plurality of grooves is formed at each intersection of adjacent said cavity walls, whereby said key end portions can freely move within each of said pair of cavities, whereby said ball valve can freely move to provide a water tight seal.

4,593,571

LINEAR ACTUATOR

John F. Schwarz, 1125 Saunders Crescent, Ann Arbor, Mich. 48103

Filed Dec. 14, 1984, Ser. No. 681,591
Int. Cl.[4] F16H *31/00*
U.S. Cl. 74—89.2 **11 Claims**



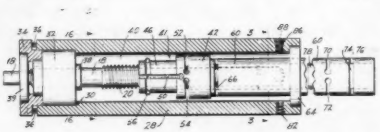
1. A rotary to linear motion transformer comprising an elongate member, a plurality of flexible strands disposed around said elongate member each attached at an end to a first rotatable member and at the other end to a second rotatable member, means for rotating said first and second rotatable members in one direction and in opposite directions, whereby rotation of said first and second rotatable members in opposite direction causes said strands to wrap around said elongate member for effecting a grip on said elongate member, and whereby rotation of said rotatable member in the same direction linearly displaces said elongate member in the direction of wrap of said strands.

4,593,572

LUBRICATED DRIVE MECHANISM

Francis M. Linley, Jr., Easton, Conn., assignor to Universal Thread Grinding Company, Fairfield, Conn.

Filed Oct. 3, 1983, Ser. No. 538,324
Int. Cl.[4] F16H *27/02, 1/18*
U.S. Cl. 74—89.15 **19 Claims**



1. A sealed screw feed device comprising, in combination:

(a) an elongate tubular housing having an interior containing a continuous uniform diametered bore and openings at both its ends communicating with said bore,

(b) a bearing for a shaft, disposed in the housing adjacent one of its ends,

(c) a shaft having precision threads, said shaft being disposed within said housing and having a drive portion journaled in said bearing and projecting from said one end of the housing, and said drive portion being provided with means for engagement by a drive device to effect its turning,

(d) a nut carried in the housing by said shaft and engaging the precision threads, said nut undergoing axial movement with respect to the housing and shaft as the shaft turns,

(e) a hollow thrust rod at one end attached to said nut, said thrust rod projecting from the other end of said housing and receiving portions of said shaft,

(f) seals disposed in the ends of the housing, engaging the drive portion of said shaft and the hollow thrust rod respectively, to seal the interior of the housing against loss of lubricant,

(g) said thrust rod having a transverse interior wall intermediate its ends to prevent the passage of lubricant through it from the housing,

(h) universal hinge means carried by an exterior portion of the thrust rod, and

(i) means connected with said universal hinge means, for attaching the same to a reciprocatable member of a peice of equipment for effecting reciprocation of the member as the shaft is turned first in one direction and then in an opposite direction,

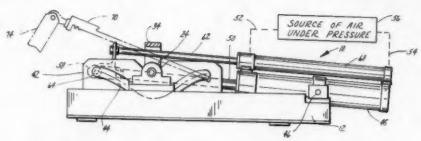
(j) all portions of said nut and all portions of the thurst rod that project into the housing being smaller than the housing bore to provide clearance which constitutes a substantially continuous and uninterrupted annular flow space therebetween past which lubricant can be forced as the nut traverses the shaft, thereby to minimize the drag of any piston effect which the nut might have on the lubricant.

4,593,573

INVERSION CAM AND CYLINDER POWER MEANS

Irvin D. Bond, 10270 Aller Rd., Clarkston, Mich. 48016

Filed Dec. 18, 1984, Ser. No. 682,847
The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.
Int. Cl.[4] F16H *21/44*
U.S. Cl. 74—104 **3 Claims**



1. Power means comprising:

a base;

power cylinder means including a cylinder having a piston rod moveable in a reciprocal, linear path of motion with respect to the cylinder, and means pivotally supporting the power cylinder means for pivotal motion on the base;

a pair of axially spaced shafts mounted on the base for rotation about an axis fixed with respect to the base, said axis of rotation being disposed generally transverse to the linear path of motion of the piston rod;

a yoke having a pair of spaced sides attached to the pair of shafts such that as the cylinder is moved in a pivotal motion on the base, the yoke and the shafts are moved in a pivotal motion about said axis of rotation, the sides of the yoke having slot means;

a cam plate having a curved cam slot mounted on the base; and

cam roller means carried on the piston rod and moveably received in both the slot means in the yoke and the cam slot in the cam plate such that the piston rod is moveable along a path of motion traversing said axis of rotation between the shafts,

whereby as the piston rod is moved at a uniform rate of motion with respect to the cylinder, the shafts are rotated at a variable rate of motion in a variance depending upon the curvature of the cam plate slot.

4,593,574
TORQUE-DEPENDENT PRESSURE MECHANISM FOR CONTINUOUSLY ADJUSTABLE BALL-TYPE PLANETARY GEAR SET

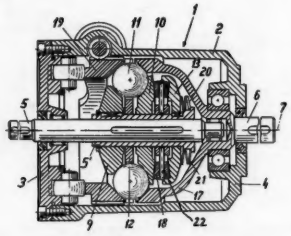
Hartmut Sinn, Ehingen; Hermann Breymaier, Munderkingen, and Günter Mutschler, Biberach, all of Fed. Rep. of Germany, assignors to Neuweg Fertigung GmbH, Munderkingen, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 487,955

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215923

Int. Cl.[4] F16H *15/26, 15/00, 15/50*

U.S. Cl. 74—198 **8 Claims**



1. In a continuously adjustable ball-type planetary gear set having a housing, a driving shaft and a driven shaft supported respectively in said housing for rotation about a common axis, a plurality of planetary balls, a first race mounted on said driving shaft for joint rotation therewith, a second race slidably supported on said driving shaft for free rotation and for axial displacement relative to said first race, said first and second races being provided with inner raceways for engaging those surface portions of said planetary balls which face said driving shaft, a third race connected for joint rotation with said driven shaft, a fourth race arranged for free rotation about said common axis opposite said third race, said third and fourth races being provided with raceways for engaging those surface portions of said planetary balls which are remote from said driving shaft, a combination comprising a torque-dependent pressure mechanism having a pressure plate mounted on said driving shaft for joint rotation therewith; said pressure plate and said second race having inclined facing surfaces defining a converging annular gap therebetween; a plurality of rolling bodies arranged in said annular gap and engaging said facing surfaces; and cam means arranged for joint rotation with said driving shaft and engaging radially said rolling bodies to displace the same radially along said inclined facing surfaces thus imparting to said rolling bodies a rotation about a helical path when a torque develops between said inclined facing surfaces.

4,593,575
MOTOR ROTATING APPARATUS

Philip L. Reid, Rte. 2, Box 422, Duncan, S.C. 29334

Filed Jan. 15, 1985, Ser. No. 691,662

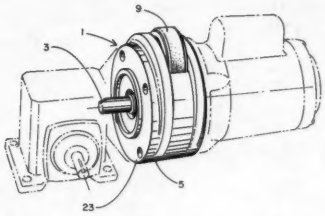
Int. Cl.[4] F16H *1/12, 1/20, 15/00;* **B23Q** *3/00*

U.S. Cl. 74—421 A **5 Claims**

1. A motor rotating apparatus comprising:

a rotatable shaft having a longitudinal axis of rotation;

means defining a housing about said rotatable shaft, means rotatably mounted within said housing for receiving an output shaft from an electrical motor, said means for receiving being in rotational communication with said rotatable shaft; and



means partially mounted within said housing for selective rotational engagement with said means for receiving.

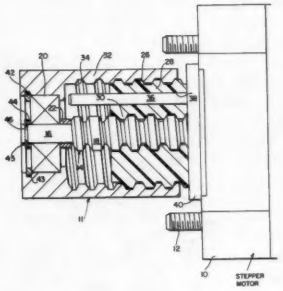
4,593,576
MICRO STEPPING DRIVE

Arnold Schindel, Fairlawn, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Feb. 21, 1984, Ser. No. 581,940

Int. Cl.[4] F16H *1/18, 1/20, 27/02*

U.S. Cl. 74—424.8 B **2 Claims**



1. A micro stepping device for reducing rotary motion comprising:

a stepper motor having a drive shaft with an axis and with a threaded section and with an outward end, said outward end having a bearing surface;

a double threaded nut engaged by said shaft and having internal and external threads of different pitch, the internal threads of the nut being screwed on the threaded shaft, the pitch of said internal threads being less than the pitch of said external threads;

a cylindrical threaded output member having internal threads screwed to the external threads of the nut for rotary movement about said axis;

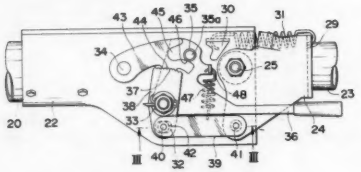
means restricting the nut to translation along the shaft in an axial direction; and

a ball bearing mounted on said bearing surface and interposed directly between the cylindrical threaded output member and the shaft for minimizing tolerance accumulations therebetween, due to eccentricity and axial positioning, wherein said drive shaft is supported by and actuated by said motor and said nut is supported by and actuated by said drive shaft and said output member is supported by said ball bearing and actuated by said nut.

4,593,577
AUTOMOTIVE STEERING COLUMN TILT ADJUSTING DEVICE

Satoshi Kinoshita, Hamana, Japan, assignor to Nissan Motor Company, Limited, Yokohama and Fuji Kiko Company, Limited, Tokyo, both of, Japan

Filed May 13, 1983, Ser. No. 494,573
Int. Cl.[4] B62D *1/18*; G05G *5/24*
U.S. Cl. 74—493 **22 Claims**



1. A tilt adjusting device for an automotive steering column comprising:

said steering column including an upper movable section and a lower stationary section;

a stationary bracket for fixedly securing said lower stationary section onto a vehicle body;

a movable bracket connected to said upper movable section for movement therewith and pivotable with respect to said stationary bracket;

a latching mechanism comprising interengageable first and second members, each having engagement means, for latching said movable bracket at a selected angular position with respect to said stationary bracket;

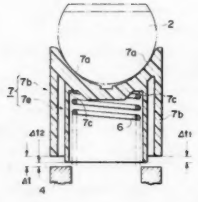
a manually operated lever for releasing the interengagement of said first and second members to permit pivotal movement of said movable bracket; and

means for co-operating said first member with said movable bracket for pivotally moving said first member according to the pivotal movement of said movable bracket, said co-operating means adapted to cause larger angular displacement of said first member for each pivotal movement of said movable bracket than the corresponding angular displacement of said movable bracket.

4,593,578
RACK AND PINION TYPE STEERING GEAR DEVICE

Nobuo Kobayashi, and Haruhiko Tanahashi, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 474,487, Mar. 11, 1983. This application Oct. 22, 1985, Ser. No. 789,359
Claims priority, application Japan, Sep. 17, 1982, 57-140802[U]
Int. Cl.[4] F16H *1/04*; B62D *1/20, 5/06*
U.S. Cl. 74—498 **3 Claims**



1. A rack and pinion type steering gear device comprising:

a housing;

a pinion supprted in said housing;

a rack in mesh with said pinion;

a rack guide slidably supported in said housing to urge said rack from behind for applying a preload to the meshing engagement of tooth surfaces of said rack and pinion;

a spring biasing said rack guide;

a nut threadably coupled to said housing for holding said rack guide at a proper position in said housing through said spring;

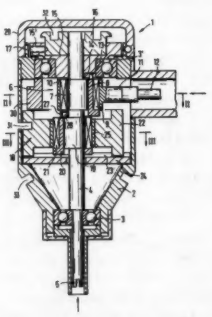
a clearance formed between said rack guide and said nut;

said rack guide being formed of an oleoresinous material having a low coefficient of friction and being elastically deformable to a compression load to a predetermined value, said rack guide including a guide body having a rack sliding surface, outer peripheral ribs axially extending toward said nut, and an elastic ring having the bottom end portion extending towards the nut farther by a predetermined distance within said clearance than the bottom end portion of said outer peripheral ribs and being elastically deformable to a compression load, such that the ring end is disposed for resiliently contacting the nut before the ends of the ribs contact the nut.

4,593,579
PROCESSING MACHINE FOR SURFACE TREATMENT

Mümin Öszüt, Morikestrasse 28, 7128 Lauffen, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,088
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 3336381
Int. Cl.[4] G05G *1/00*; F16H *21/20*
U.S. Cl. 74—571 R **14 Claims**



1. Processing machine for the surface treatment of workpieces in which a push rod connected to a processing tool is reciprocated by an eccentric drive assembly whereby the imbalance of said eccentric drive assembly is automatically counterbalanced by an eccentric mass balance assembly, with the eccentric of said eccentric drive assembly and the countereccentric of said mass balance assembly being of equal size and being arranged non-rotatably on a drive shaft, said eccentric and said countereccentric displaced 180° about the axis of said drive shaft with respect to one another, characterized by the fact that said eccentric (7) of said eccentric drive assembly (6) is provided with an eccentric casing (8) and said countereccentric of said eccentric mass balance assembly (18) is provided with a countereccentric casing (20), that said eccentric casing (8) and said countereccentric casing (20) are connected to each other non-rotatably and together are rotatable relative to said eccentric (7) and said countereccentric (19), respectively, that on said countereccentric casing (20) there is positioned a counterbalance weight (22) which is adjustably guided in a longitudinal guide (23) parallel to said push rod (12), and that an adjusting device to change the throw of said eccentric

comprises a handle (16) connected non-rotatably to said drive shaft (4) and a bearing piece (15) connected non-rotatably to said eccentric casing (8) and said countereccentric casing (20), with said handle (16) and said bearing piece (15) being non-rotatably connectable to each other by means of a setscrew (17) whereby rotation of said handle (16) with respect to said bearing plate (15) causes rotation of said eccentric (7) and said countereccentric (19) with respect to said eccentric casing (8) and said countereccentric casing (20), respectively, to change the throw of said eccentric and automatically counterbalance said eccentric drive assembly.

4,593,580

DEVICE FOR SHIFTING WITHOUT CLUTCH AND WITHOUT SYNCHRONIZING ELEMENTS IN A MULTIPLE GEAR RATIO TRANSMISSION OF A VEHICLE

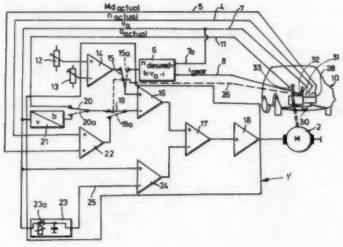
Bernd-Guido Schulze, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Continuation of Ser. No. 326,662, Dec. 3, 1981, abandoned. This application Jun. 17, 1985, Ser. No. 745,374

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045840

Int. Cl.⁴ B60K *41/08*

U.S. Cl. 74—858 **3 Claims**



1. A drive for a vehicle comprising:

a driving engine;

power control means coupled to said engine for adjusting the speed of said engine during a gear change;

a multiple gear ratio transmission for coupling said engine to the wheels of said vehicle;

engine speed detecting means for generating signals corresponding to said speed of said engine;

engine torque detecting means for generating signals corresponding to the torque of said engine;

vehicle speed detecting means for generating signals corresponding to the speed of said vehicle;

gear shift operation detecting means for generating signals corresponding to the old and new gears involved in said gear change; and

regulating means, coupled to said power control means and responsive to said engine speed signals, said engine torque signals, said vehicle speed signals, and said gear shift operation signals, for adjusting said power control means of said engine to a torque-free condition prior to disengagement of the old gear, and for adjusting said power means for substantially continuously adjusting and controlling said speed of said engine starting substantially at the time of said disengagement of said old gear, and ending substantially at the time the new gear is engaged, from a speed corresponding to said vehicle speed in the old gear, to a synchronous speed corresponding to said vehicle speed in the new gear according to the shift operation being performed.

4,593,581

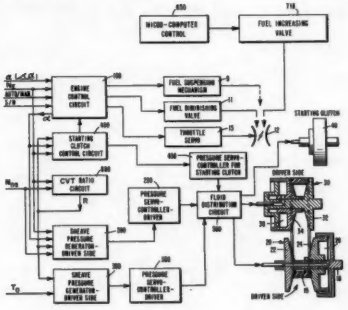
MICROPROCESSOR CONTROLLED SYSTEM AND METHOD FOR INCREASING THE FUEL FLOW TO THE PRIME MOVER OF A POWER DELIVERY SYSTEM HAVING A CONTINUOUSLY VARIABLE RATIO TRANSMISSION UPON A COMMANDED INCREASE IN POWER DELIVERY

Takashi Omitsu, Madison, Wis., assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 24, 1984, Ser. No. 581,293

Int. Cl.⁴ B60K *41/18, 41/12*

U.S. Cl. 74—866 **12 Claims**



1. A system for controlling the operation of a power delivery system including an engine of an engine-driven vehicle and a continuously variable ratio transmission coupled to said engine for delivering power from said engine to an output shaft, said engine having fuel delivery means for delivering a variable quantity of fuel thereto, wherein the duty cycle of said fuel delivery means is set to discrete levels which are directly proportional to the change in commanded system performance, said power delivery system being controlled by command means for commanding a desired power delivery system performance, the system comprising:

actual system performance measuring means for measuring the actual performance of the power delivery system;

ratio control means operatively coupled to said command means and said actual system performance measuring means for controlling the ratio of said transmission as a function of the desired system performance commanded by said command means and the measured actual system performance, the speed of said engine varying as a function of transmission ratio;

fuel function means defining a desired fuel requirement for said engine in relation to engine operating speed;

speed measuring means for measuring the speed of said engine;

fuel control means operatively coupled to said fuel function and said fuel delivery means for controlling said fuel delivery means only in accordance with the fuel requirement defined by said fuel function means, so that the fuel delivered to said engine is determined only by the speed thereof; and

microprocessor controlled fuel increasing means, separate from said fuel control means, for increasing fuel flow to said fuel delivery means above that required by said fuel function means when the system performance commanded by said command means is increased, said fuel increasing means increases fuel flow by an amount proportional to the rate at which the system performance commanded by said command means is increased and includes:

input means for inputting to the microprocessor first and second system performance commands, the microprocessor processing said first and second system performance commands to arrive at a change in commanded system performance; and

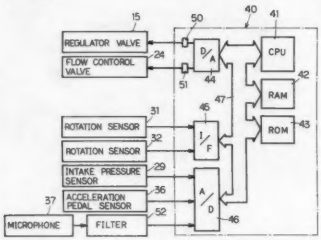
fuel flow means for controlling the fuel flow to the fuel delivery means at a duty cycle which is directly proportional to the change in commanded system performance.

4,593,582

CONTINUOUSLY VARIABLE TRANSMISSION MEANS FOR USE IN VEHICLES

Daisaku Sawada, Gotenba; Takashi Shigematu, and Setsuo Tokoro, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 12, 1983, Ser. No. 541,249
Claims priority, application Japan, Oct. 15, 1982, 57-179862
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—866 **4 Claims**



1. A continuously variable transmission means for controlling a speed of an engine installed in a vehicle, comprising:

a driving pulley including a fixed member and a movable member, said movable member being actuated by an hydraulic cylinder to form a V-shaped opening between the fixed and movable member;

a driven pulley with another fixed member and another movable member, said another movable member being actuated by another hydraulic cylinder to form another V-shaped opening between said another fixed member and said another movable member;

a flexible endless belt member spanning the pulleys such that the diameter of the pulleys can be varied relative to each other to result in different transmitting ratios;

a throttle means for controlling an engine speed;

a detecting means for detecting a basic frequency and a higher harmonic frequency of the engine in accordance with an operating condition of the engine;

a storing means for storing a predetermined basic value;

a comparison means for comparing the detected frequency with the stored predetermined basic value; and

a control means for controlling the engine speed in response to said comparison means comparing the detected frequency with the stored basic value and thereafter changing the transmitting ratio between the driving and driven pulleys.

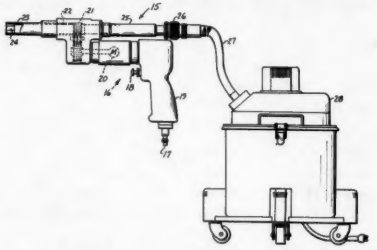
4,593,583

TORQUE TOOL ADAPTED TO SET A FASTENER AND TO SECURE AND RETAIN FASTENER FRAGMENTS

Arthur M. Singleton, Dunwoody, Ga., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Oct. 25, 1982, Ser. No. 436,591
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.14 **6 Claims**

1. A torque tool for applying torque to set a frangible threaded fastener which fastener when set by the tool yields a detached fastener fragment, and to secure and retain said detached fastener fragment, said tool comprising: a torque-applying socket with a driving end, said socket having at its driving end an open-ended internal array of fastener-engaging surfaces adapted to receive and engage the portion of the fastener comprising said fragment, and an internal passage extending into and away from said array; a drive spindle to which said socket is attachable in order to be driven by said spindle, and an internal passage through said spindle connected to said internal passage; power means drivingly connected to said spindle to rotate said spindle; conduit means fluidly connected



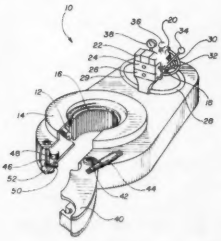
to said internal passage of said spindle; and suction means fluidly connected to said conduit, whereby detached fastener fragments are drawn from said drive socket into and through said internal passages and said conduit means by suction exerted by said suction means.

4,593,584

POWER TONGS WITH IMPROVED HYDRAULIC DRIVE

Billy W. Neves, Odessa, Tex., assignor to Eckel Manufacturing Co., Inc., Odessa, Tex.

Filed Jun. 25, 1984, Ser. No. 624,146
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.18 **18 Claims**



1. A power tong for making up and breaking apart a pipe joint, comprising:

a ring member rotatable relative to a tong body and having a plurality of interior camming surfaces;

a cage plate at least partially disposed between said ring member and said pipe joint;

a plurality of jaw members carried by said cage plate assembly for gripping engagement with said pipe joint upon rotation of said ring member;

a source of pressurized fluid;

a high speed/low torque motor responsive to said pressurized fluid for rotating said ring member;

a medium speed/medium torque motor responsive to said pressurized fluid for rotating said ring member;

said high speed/low torque motor and said medium speed/-medium torque motor being mechanically connecting in tandem with a common drive shaft such that motors rotate said common drive shaft in unison to drive said ring member;

a valve block positionable in a first position for directing substantially all pressurized fluid to said high speed/low torque motor, and positionable in a second position for

directing substantially all pressurized fluid to said medium speed/medium torque motor; and

said valve block further positionable in a third position for directing pressurized fluid simultaneously through both said motors for rotating said ring member at a lower speed and a higher torque than said medium speed/medium torque motor;

whereby said tong may be operated in any of of a three different speed/torque ranges without shifting gears into and out of driving engagement with said ring member.

4,593,585

ADJUSTABLE WRENCH

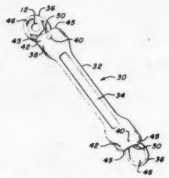
Carl R. Hurtig, Cohasset, Mass., assignor to Encor, Limited, Cohasset, Mass.

Division of Ser. No. 323,658, Nov. 20, 1981, Pat. No. 4,488,461. This application Oct. 22, 1984, Ser. No. 663,554

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl.[4] B25B *13/28*

U.S. Cl. 81—98 **2 Claims**



1. A wrench for turning all nuts having a number of planar faces and a predetermined maximum size comprising:

an elongate handle having a contact surface disposed on at least one end thereof, said surface operative to engage a confronting face of said nut adjacent one corner thereof and generally normal said confronting face;

a wrench head disposed on said one end of said handle and having an opening therein for insertion of said nut, the size of said opening being adjustable to accommodate a range of sizes of nuts, said opening having opposed interior surfaces in spaced confronting relationship with said contact surface, said wrench head being angularly disposed with respect to said handle; and

means for urging said contact surface into engagement with said confronting face of a nut disposed within said opening to capture the nut between said contact surface and said opposed surfaces to permit the transfer of torque applied to said handle from said contact surface and said opposed surfaces to the faces of said nut at three points, each of said three points being spaced from the center of its associated nut face, said engaged corner being that which is to the side of the nut which is in the same direction as the direction of rotation of said handle.

4,593,586

TRACER CONTROL CIRCUIT FOR MACHINE TOOLS

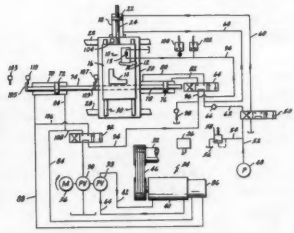
Gerald G. Cudnohufsky, Drayton Plains, Mich., assignor to Programmable Tracing Incorporated, Madison Heights, Mich.

Filed Jun. 7, 1984, Ser. No. 618,229

Int. Cl.[4] B23B *3/28*

U.S. Cl. 82—14 A **6 Claims**

1. In a tracer control circuit for a machine tool of the type including a base, a longitudinally movable carriage on the base and a cross slide mounted on the carriage for movement therewith and also for movement thereon in a direction transversely to the longitudinal path of travel of the carriage, a cutting tool and a tracer valve mounted on the cross slide for movement therewith, said tracer valve having a restrictable orifice for controlling the flow of fluid therethrough and a template fixedly mounted on said base and having a contour corresponding to the contour to be machined on a workpiece, said tracer valve having a stylus thereon movable in response to engagement with the template to thereby variably restrict the flow of fluid through the tracer valve in accordance with the contour of the template and thereby control the longitudinal and transverse paths of travel of the cutting tool, the combination comprising a hydraulic piston cylinder assembly interconnecting the cross slide and the carriage to control movement of the cross slide on the carriage, a first source of hydraulic pressure capable of developing a pressure of a predetermined maximum value, a second source of hydraulic pressure capable of developing a higher pressure than said first source, a first feed line extending from said first pressure source to one end of said cylinder so that the pressure therein biases the cross slide in one direction on the carriage to shift the stylus toward the template, a second feed line extending from said second source to said restrictable orifice, the pressure in said second feed line being determined by the degree of restriction at said orifice, a carriage drive member, means for displacing the carriage drive member at a predetermined rate in the longitudinal feed direction, a second piston cylinder assembly interconnecting the carriage drive member and the carriage for controlling movement of the carriage relative to the drive member in said longitudinal direction, a branch line interconnecting said second feed line with one end of said second cylinder so that the

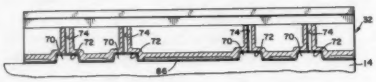


pressure in said one end of the second cylinder tends to displace the carriage relative to the carriage drive member in a direction opposite said longitudinal feed direction, a conduit interconnecting the opposite ends of the two cylinders in closed circuit so that the fluid exhausted from said opposite end of either cylinder is constrained to flow to the opposite end of the other cylinder, whereby, when the stylus engages the template in a manner tending to increase the restriction at the tracer valve, the pressure in the second feed line increases and the pressure at said opposite ends of the two cylinders correspondingly increase so that, when the stylus engages an edge portion of the template contour that extends parallel to said longitudinal direction, the pressure in the second feed line increases to a value that causes the pressure fluid forces on the opposite sides of the piston in the first cylinder to equalize and the cross slide remains stationary relative to the carriage and, when the stylus engages an edge portion on the template contour that is parallel to said transverse direction, the pressure in the second feed line increases to an even higher value such that fluid is displaced from said opposite end of the second cylinder and into said opposite end of the first cylinder at a rate to cause the carriage to shift relative to the carriage drive member at a rate equal to and in a direction opposite the rate and direction the carriage drive member is displaced in the feed direction, whereby the carriage remains stationary relative to said base and the cross slide is displaced on the carriage in a direction opposite to said first-mentioned transverse direction.

4,593,587
MACHINE TOOL UTILIZING FORCE TRANSMITTING JOINTS

Arthur F. Nenadal, N. Olmsted, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Continuation of Ser. No. 282,635, Jul. 13, 1981, abandoned. This application Jun. 27, 1985, Ser. No. 749,128
Int. Cl.[4] B23B *17/00*
U.S. Cl. 82—32 9 Claims



1. A force transmitting joint in combination with a turning machine (10) of the type having a base (12) that includes a bed portion (14), a headstock (16) mounted to said base (12) and supporting a driven rotatable spindle (18), a way block (32) having a pair of elongated ways (34, 35), means for mounting the way block (32) having a pair of elongated ways (34, 35), with said ways extending along a longitudinal axis of said bed portion (14), means for mounting the way block (32) to the bed portion (14) of the base (12), a support assembly (28) mounted for movement on said pair of elongated ways (34, 35), and a tool turret (46) mounted on the tool turret assembly (28), the improvement wherein the means for mounting the way block (32) to the bed portion (14) of the base (12) is characterized by a force transmitting joint comprising:

a plurality of spaced apart recesses (72) formed in either one of the bed portion (12) or the way block (32) each of said recesses formed with a peripheral surface;

a plurality of integral projections (70) spaced apart corresponding to said spacing of said recesses, extending from the other of the bed portion (12) or the way block (32), at least a portion of each of said projections extending into and in spaced relationship to a respective recess to form a clearance space with said peripheral surface of each of said recesses extending completely about a respection projection; and

castable grout (86) disposed around said projections, in said clearance space between said projections (70) and said recesses (72) and between adjacent recesses so that the grout (86) forms a continuous layer between the way block (32) and the bed portion (14) of the base (12) whereby said way block may be adjustably positioned on said bed portion prior to emplacement of said grout in said clearance space and said castable grout resists shearing forces in any direction generatd by machining by being compressed in said space between each of said projections and said peripheral surface of each of said recesses.

4,593,588
FACE DRIVE FOR LATHE

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,381
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 8321303[U]
Int. Cl.[4] B23B *33/00*
U.S. Cl. 82—40 R 8 Claims

1. In combination with a lathe provided with means for rotating a workpiece about an axis with one end face of the workpiece directed axially backward and having a radially outer periphery generally centered on the axis, a drive comprising:

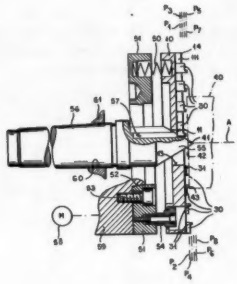
a body axially adjacent the workpiece end face and rotatable about the axis;

means for rotating the body about the axis;

a face plate rotationally fixed on the body, formed with a plurality of angularly equispaced and axially forwardly open grooves, and lying between same and the workpiece end face;

means mounting the face plate on the body for joint rotation therewith and axial movement relative thereto;

a plurality of sets of drive formations fixed on the face plate is said open grooves and directed axially forward toward the workpiece, each set being comprised of a respective plurality of the formations angularly equispaced about the axis and radially equispaced therefrom by a respective radius different from the radius between the formations of any of the other sets and the axis, the formations of each set having axially inner edges lying in a respective plane perpendicular to the axis and offset from the planes of the



other sets, the plane of the set with the smallest radius being axially rearmost, the plane of the set of the largest radius being axially foremost, and the remaining planes being graduated therebetween;

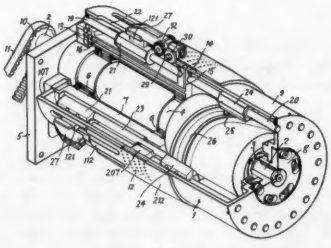
means for securing the sets of drive formations in the grooves; and

means for urging the face plate axially forward toward the workpiece end face and for thereby pressing one set of formations axially inward against the workpiece and rotationally coupling it to the face plate and body, whereby the one set engaging the workpiece is the set having the largest radius that is generally equal to or smaller than the radius of the workpiece periphery.

4,593,589
WEB CUTTING DEVICE

Gianluigi Gherardi, Medicina, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed Mar. 9, 1983, Ser. No. 473,624
Claims priority, application Italy, Mar. 23, 1982, 12481 A/82
Int. Cl.[4] B26D *1/20, 7/08*
U.S. Cl. 83—168 23 Claims



1. A cutting device for severing a continuous web into individual successive segments, comprising:

a rotating supporting drum on which the end portion the web is supported;

a plurality of web-cutting blades that are mounted on the drum at equi-spaced positions around the circumference thereof, said web-cutting blades being movable parallelly to the axis of the drum; and

actuating means for cyclically moving said blades in a plane transverse to the web and substantially parallel to the axis of the supporting drum so as to effect a progressive transverse cut of the web from one longitudinal edge thereof to the opposite longitudinal edge thereof in order to sever successive segments from the end of the web on the supporting drum, said actuating means including means for providing, at the angular position on the supporting drum where the cut is to be effected, an extension or cutting stroke through the web from a laterally-retracted start position at one longitudinal edge to at least the opposite edge of the web, and for thereafter providing a corresponding retraction stroke to return to the start position,

wherein said plurality of web-cutting blades includes a plurality of groups of at least two side-by-side blades, spaced from each other and movable simultaneously, with the spacing between the blades of each group of blades and the distance between two successive groups of blades being equal to the length of each segment to be severed from the web.

4,593,590

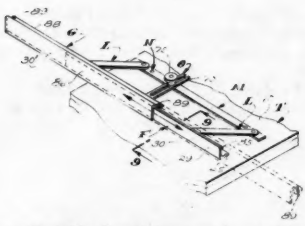
POWER TOOL FENCE

Harold Z. Gray, 15577 Tacony Rd., Apple Valley, Calif. 92307

Filed Nov. 19, 1984, Ser. No. 672,603

Int. Cl.⁴ B27B *27/10*

U.S. Cl. 83—438 **4 Claims**



1. An adjustable fence structure in combination with a power tool work table having a flat, horizontal top work supporting surface, forwardly and rearwardly disposed front and rear edges, oppositely disposed inner and outer side edges and longitudinal and lateral axes, said fence structure includes an elongate mounting rail, mounting means spaced longitudinally of the mounting rail and engaging said table to releasably secure the mounting rail on said supporting surface parallel with said longitudinal axis thereof, an elongate fence rail, positioned laterally inward of the mounting rail and having a laterally outwardly disposed vertical inner surface and a flat bottom surface in sliding supported engagement on said support surface, elongate front and rear links with inner and outer ends, the links are equal in longitudinal extent are spaced longitudinally of the rails and are in spaced parallel relationship with each other, coupling means pivotally coupling the inner and outer ends of the links to related front and rear portions of said rails with the longitudinal spacing of the coupling means at the inner and outer ends of the links spaced equidistant, lock means releasably locking the rails and the links against relative pivotal movement with said rails in set lateral spaced parallel relationship and including an elongate bar with inner and outer ends, coupling means pivotally coupling the inner end of the bar to the fence rail in spaced relationship between the inner ends of the links and screw means releasably securing the outer end portion of the bar to the mounting rail at a position spaced between the outer ends of the links with the axis of the bar angularly related to the longitudinal axes of the links and rails, said fence rail has a longitudinally extending vertical inner flange with a longitudinally extending upper edge and an elongate glide with a flat, vertical inner work-engaging flange in supported engagement with the inner surface of the fence rail and a longitudinally extending laterally inwardly and downwardly formed upper edge portion in sliding supported hooked engagement over the upper edge of the inner flange and shiftable longitudinally relative thereto.

4,593,591

CHAIN SAWS AND CHAINS THEREFOR

Cornelis J. M. Beerens, 40-42 Berkshire Road, North Sunshine, Victoria, Australia

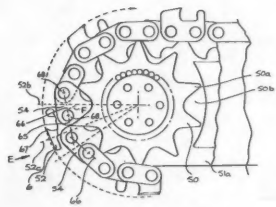
PCT No. PCT/AU83/00037, § 371 Date Nov. 29, 1983, § 102(e) Date Nov. 29, 1983, PCT Pub. No. WO83/03379, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 30, 1983, Ser. No. 557,185

Claims priority, application Australia, Mar. 30, 1982, PF3368/82; Aug. 6, 1982, PF5248/82; Nov. 24, 1982, PF6955/82

Int. Cl.⁴ B27B *33/14, 17/02*

U.S. Cl. 83—834 **11 Claims**



1. A chain saw, comprising:

a bar having a periphery and a nose portion at one end thereof; and

a chain supported on the bar to travel about the periphery thereof;

said chain comprising a plurality of cutter links;

a respective drive link pivotally connected by pins to each end of each cutter link;

each cutter link having a transverse land with a cutting edge at the forward end and a heel at the rear end;

each drive link having a dependent tongue to be received between successive teeth of a drive sprocket;

said nose portion of the bar includes an idler sprocket supported by the bar for rotation about an axis normal to the bar;

said idler sprocket having a gullet between respective teeth thereof to receive the drive link tongues of the chain as the chain passes around the nose portion of the bar;

said idler sprocket gullets and the drive link tongues of the chain having leading and trailing faces and being shaped so that when in interfitting relation the drive link common centerline of the pins pivotally connecting the drive link to the links on either side thereof is outwardly inclined in the forward direction of travel of the chain at an angle to the line radial to the idler sprocket axis and passing through the center of the root of the gullet between the idler sprocket teeth in which the drive link tongue is received;

whereby the cutter link common centerline of the pins pivotally connecting the respective cutter links to the drive links at either end thereof is inwardly inclined in the forward direction of travel of the chain at an angle to the line radial to the axis of the idler sprocket and that intersects said cutter link common centerline substantially midway

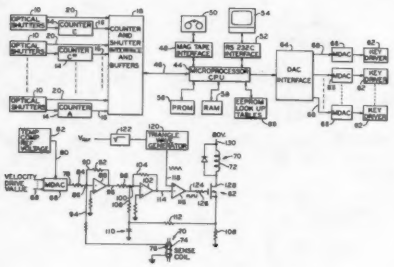
between the pins of the cutter link as it passes around the nose portion of the bar.

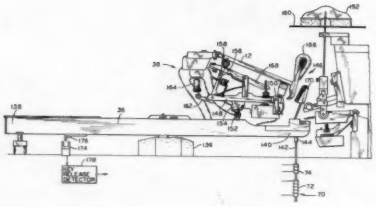
4,593,592

METHOD AND APPARATUS FOR ALTERING ACTUATOR DRIVE IN A REPRODUCING PIANO

Wayne L. Stahnke, Marina del Rey, Calif., assignor to Kimball International, Inc., Jasper, Ind.

Filed Jun. 24, 1985, Ser. No. 747,772
Int. Cl.[4] G10F *1/02*; G10H *3/00*
U.S. Cl. 84—21 **16 Claims**





1. A reproducing piano comprising:

a plurality of keys,

piano action means actuated by said keys to move hammers into contact with respective strings when the pertaining keys are depressed, said hammers being positively engaged by said action means until let-off occurs after which the hammers travel in free flight toward the strings, and

key actuation means including actuators in engagement with said keys for selectively moving said keys at a controlled velocity until let-off occurs and moving said keys at a second higher velocity after let-off occurs, whereby the action is accelerated after let-off to prevent double hammer strikes.

4,593,593

HOUSING STRUCTURE OF KEYBOARD MUSICAL INSTRUMENT

Mario Bellini, Milan, Italy, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

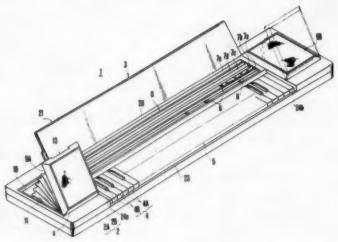
Filed Dec. 19, 1984, Ser. No. 684,276
Claims priority, application Japan, Jan. 26, 1984, 59-8254[U]
Int. Cl.[4] G10C *3/02*
U.S. Cl. 84—177 **9 Claims**

1. A housing structure of a portable keyboard electronic musical instrument, comprising:

a musical instrument body having a keyboard portion and an operation panel arranged adjacent to said keyboard portion;

a cover having a hinge portion along alignment direction of said keys so as to swing to open and cover said keyboard portion and said operation panel, and a foldable portion at which said cover is folded when said cover is opened, said cover and said musical instrument body being integrally formed of plastic material to have a relatively thin and flexible portion which constitutes said hinge portion; and

a cover lock portion formed in the upper surface of said musical instrument body for locking said cover at a predeter-



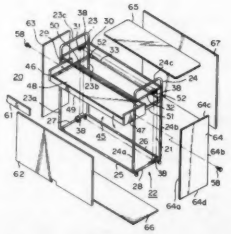
mined inclination relative to the upper surface of the musical instrument body when said cover is opened and folded at the foldable portion, whereby a configuration adapted for carriage is accomplished with a combination of said cover and said musical instrument body.

4,593,594

HOUSING FOR UPRIGHT PIANOS

Hiroki Tachida; Takane Sato, and Shigeaki Sato, all of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jul. 24, 1984, Ser. No. 633,858
Claims priority, application Japan, Jul. 27, 1983, 58-137067
Int. Cl.[4] G10C *3/04*
U.S. Cl. 84—185 **8 Claims**



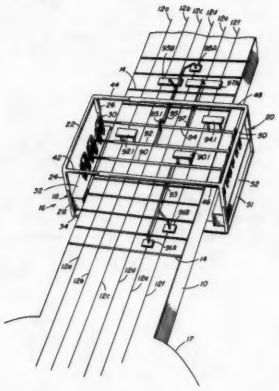
1. A housing for upright pianos comprising at least one metallic skeleton of a substantially rectangular solid construction, a keyboard assembly mounted between a pair of spaced-apart holder arms pivotally attached to said metallic skeleton, said holder arms adapted for swinging said keyboard assembly between a horizontal position projecting forward from said housing and an inclined position fully accommodated within said housing, a piano plate vertically supported within said metallic skeleton and having a side section adjacent at least one of said holder arms, a plurality of boards covering gaps in said metallic skeleton, and limiting means provided on said side section of said piano plate for limiting the pivotal movement of said keyboard assembly between said horizontal and inclined positions by engagement within said one of said holder arms.

4,593,595

MECHANICAL GUITAR CHORD MAKER

David Rand, Jr., 1900 Palm City Rd. Bldg. 25, Stuart, Fla. 33497

Filed Oct. 11, 1984, Ser. No. 659,690
Int. Cl.[4] G10D 3/08
U.S. Cl. 84—317 10 Claims



1. A chord playing attachment for string musical instruments employing a fretted neck with a plurality of strings stretched over it, comprising:

a supporting frame for removable attachment to said neck, said frame including means for removably receiving a chord-selector component, and a chord-selector component comprising an elongated member adapted to extend transversely across the stringed face of said neck and longitudinally compressible resilient members extending substantially perpendicular from two end-regions of said elongated member adjacent respective sides of said neck for removably mating said chord-selector component to said supporting frame, said resilient members holding said elongated member spaced from said strings while permitting said elongated member to be pressed toward said strings for selecting a chord, and string-contacting means fixed to said elongated member for selecting a prescribed chord when said elongated member is pressed toward said strings.

4,593,596

PORTABLE DRUM SET

Gary L. Gauger, 15108 Highland La., Minnetonka, Minn. 55343

Continuation-in-part of Ser. No. 505,207, Jun. 17, 1983. This application Jan. 28, 1985, Ser. No. 695,437
Int. Cl.[4] G10G 5/00
U.S. Cl. 84—421 8 Claims

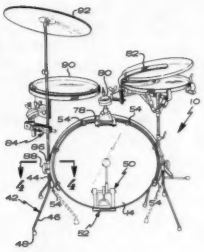
1. A lightweight, compact, portable drum set for use on a supporting surface comprising:

a pre-tuned bass drum head having a diameter and a rim;

an arcuate member having first and second ends and a diameter, said member diameter being slightly larger than said bass head diameter and extending around greater than half said circumference of said bass head;

a plurality of clamps for retaining said bass head to said member, one of said clamps being located adjacent each said end and at least two of said clamps being located between said clamps which are adjacent said ends;

first and second leg means attached to said arcuate member approximately diametrically opposite one another and retaining said bass head and said member in a substantially



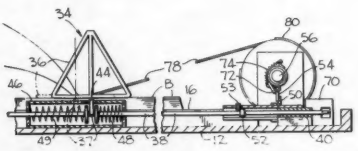
vertical plane relative to the supporting surface, said bass head and member being free of contact with the surface.

4,593,597

PAGE-TURNING APPARATUS

Ernest E. Albrecht, 456 Glenmoor Rd., and Paul Cooper, 1429 Birch St., both of Canon City, Colo. 81212

Filed Feb. 28, 1985, Ser. No. 706,840
Int. Cl.[4] G10G 7/00
U.S. Cl. 84—487 5 Claims



1. Apparatus for turning the pages of a book or the like which comprises

a platform adapted to support a book thereon,

a movable member having a frictional tip adapted to engage the surface of a book page,

means for moving said movable member to frictionally engage and push the book page toward the opposite page of the book,

page hold-down means normally but releasably urged into engagement with both of the adjacent pages of the book,

means operative to release said page hold-down means from page engagement, and

means connecting said member-moving means and said page hold-down means so that said latter means is released automatically to an inoperative position during movement of said member-moving means.

4,593,598

CARTRIDGE RESIZING APPARATUS

James A. Gunder, 13963 McCurie St., Taylor, Mich.

Filed Sep. 7, 1984, Ser. No. 648,296
Int. Cl.[4] F42B 33/10; B21D 51/54; B21K 21/04; B23P 15/22
U.S. Cl. 86—36 12 Claims

1. An apparatus for resizing rifle bullet cases having a flanged head and a tubular body, said apparatus comprising:

a frame including a head, a base and means for fixedly positioning said head with respect to said base;

a ram;

lever means for displacing said ram with respect to said frame between said frame base and said frame head;

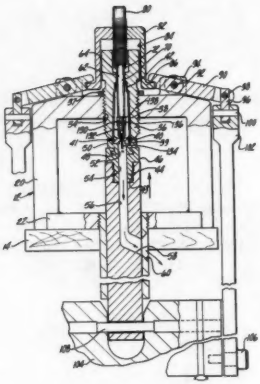
means for fixedly and removably retaining the flanged head of said rifle case on the end of said ram, said means being

interchangably removed from the end of said ram in order to accommodate case heads of different sizes;

a sizing die having a sizing cavity which closely conforms to the configuration of the rifle case;

means for removably and adjustably securing said sizing die to said frame head in alignment with said ram;

a sizing punch adapted to be received through the neck of said rifle case, said punch including an extractor pin at one end for extracting the primer of said case head, abutment means for engaging the head wall of the case and means for radially expanding the neck of said case to a predetermined size;



means for supporting said punch within said sizing die wherein said punch extends into said rifle case as said case is inserted within said sizing cavity;

means for displacing said punch downwardly with respect to said sizing die wherein said abutment means engages said head wall of the case in order to initiate extraction of said case from said die; and

lever means for displacing said ram with respect to said sizing die between a first position in which said retaining means on said ram positions the case where the case is spaced apart from said sizing die and a second position in which the case is inserted within said sizing cavity of said die and said sizing punch extends into said case.

4,593,599

ROPE ASSEMBLIES

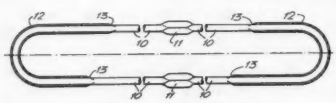
John K. Yeardley, London, England, assignor to Bridon Plc, Yorkshire, England

Filed Aug. 6, 1984, Ser. No. 637,720

Claims priority, application United Kingdom, Aug. 12, 1983, 8321773

Int. Cl.[4] D07B *1/18, 1/20;* D04C *1/12;* B66C *1/12*

U.S. Cl. 87—6 **8 Claims**



1. A rope assembly comprising

a load-bearing rope, having a main portion and two end portions, made at least predominantly of non-metallic material, and having a diameter appropriate to a rope;

a layer of buoyant, substantially non-absorbent, flexible material arranged around the rope, the layer being of a thickness that is substantially less than the diameter of the rope and that is substantially uniformly thick over its whole area, and being generally in the form of sheet positioned around the rope; and

a flexible jacket made at least predominantly of non-metallic material outside the layer of buoyant material and holding it in place, and being of a thickness substantially less than the diameter of the rope;

and wherein the buoyant material is present in such a quantity, and the layer thereof is of such a thickness, that the rope assembly will float on water.

4,593,600

DEVICE FOR FEEDING SHELL AMMUNITION WITHIN AN ARMORED VEHICLE

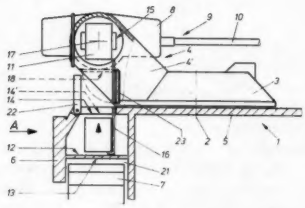
Gert Kaustrater, Augsburg, Fed. Rep. of Germany, assignor to KUKA Wehrtechnik GmbH, Fed. Rep. of Germany

Filed Oct. 5, 1983, Ser. No. 539,378

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237729

Int. Cl.[4] F41F *9/02*

U.S. Cl. 89—33.1 **13 Claims**



1. A device for feeding ammunition shells within an armored vehicle to a shell-firing weapon in said armored vehicle, the device comprising

a single horizontally-extending container switching chute for conducting shell containers in opposite directions along a path therethrough,

a turret comprising first and second shield halves,

means for rotatably supporting the turret on the armored vehicle for rotation to an index position,

a shield situated above the turret,

weapon support means for changing the angle of elevation of the shell-firing weapon around a substantially horizontal axis of elevation, the weapon support means being mounted on the shield halves which cooperate to enclose the weapon support means and the substantially horizontal axis of elevation therebetween, the weapon support means including a pair of separate container shoe means for detachably locking each shell container to the weapon support means and conducting shells from a shell container to the shell-firing weapon, the pair of container shoe means being spaced-apart to lie in straddling relation to the shell-firing weapon thus defining a pair of spaced-apart shell container emptying sites,

first bridge means for transporting a shell container from said single horizontally-extending container switching chute to one of the container shoe means when the turret is rotated to the index position and the angle of elevation of the shell-firing weapon corresponds to the index position, the first bridge means intersecting said single horizontally-extending container switching chute to define a first container reloading station for receiving shell containers transported through said single horizontally-extending container switching chute in a first direction,

second bridge means for transporting a shell container from said single horizontally-extending container switching chute to the other of the container shoe means when the

turret is rotated to the index position and the angle of elevation of the shell-firing weapon corresponds to the index position, the second bridge means intersecting said single horizontally-extending container switching chute to define a second container reloading station for receiving shell container transported through said single horizontally-extending container switching chute in a second direction opposite to said first direction, said second container reloading station being separated in spaced-apart relation to said first container reloading station, whereby a first shell container storing a first type or shell is movable to said one container shoe means for loading into the shell-firing weapon via said single horizontally-extending container switching chute and the first bridge means and a second shell container storing one of the first type of shell and another type of shell is movable to said other container shoe means for loading into the shell-firing weapon via said horizontally-extending container switching chute and the second bridge means so that said shell-firing weapon is able to fire selectively a shell from either of the first and second shell containers.

4,593,601

RECOIL SPRING SYSTEM FOR SELF LOADING FIRE ARMS

David E. Smith, 5 Park Avenue, Telscombe Cliffs, Sussex, England

Filed Mar. 26, 1984, Ser. No. 593,391
Claims priority, application United Kingdom, Mar. 28, 1983, 8308439
Int. Cl.[4] F41D *11/12*
U.S. Cl. 89—199 **5 Claims**

1. In a self loading fire arm of the pistol type comprising:

a frame;

a barrel removably mounted to said frame;

a removable breech block slide mounted for reciprocating movement on said frame between a forward battery position and a rearward retracted position, the frame and slide including guide means extending longitudinally thereof for guiding said reciprocating movement and said slide having front and rear end walls and side walls in which are provided respective spring receiving means extending lengthwise of the slide for substantially the full length thereof; and

spring means for exerting pressure in a forward direction on said slide to regulate the recoil of the slide upon discharge of a cartridge in said barrel, said spring means comprising a pair of compression springs held under compression in respective ones of said spring receiving means with the forward end of the compression spring held in each spring receiving means being supported at the forward end of the spring receiving means, said frame comprising a pair of stops engaged by the rearward ends of said compression springs;

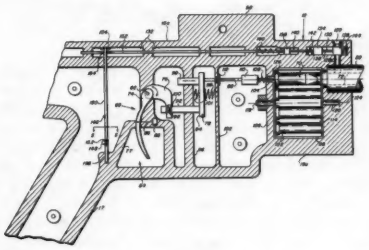
the improvement in that said spring receiving means each comprise a tunnel in said slide, each said spring receiving means being limited at its rear end by the rear wall of the slide; a slot extends lengthwise of the rear portion of each said tunnel and has a portion thereof extending through the rear wall of the slide, each said slot connecting the tunnel to the exterior of the slide, and the stops on said frame extend through said slots to engage the rear ends of said compression springs, the stops being positioned on said frame to be received in said slot portions in said rear wall of the slide when the slide is in its forward battery position.

4,593,602

ROCKET WEAPON SYSTEM AND METHOD THEREFOR

John J. Faix, Cocoa, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 4, 1984, Ser. No. 678,198
Int. Cl.[4] F41F *3/04*
U.S. Cl. 89—1.813 **17 Claims**



1. The method of aiming and firing a rifle-actuated rocket weapon system for destroying a target, the system being generally made up of a rifle and a rocket weapon launcher mounted thereon, the method comprising the steps of:

generally aiming the rifle of the system toward a target,

selectively firing one or more tracer bullets after the rifle is generally aimed such that the rifle is reaimed toward the target in relation to the tracer-designated path of the previously fired bullet until a tracer bullet impacts the target thereby indicating the system is finally aimed for firing the rocket weapon thereof,

providing selectively interconnectable fluid passageway means for interconnecting the bullet accelerating and guiding passageway of the rifle with the rocket motor igniter of the rocket weapon within the launcher, and

firing another tracer bullet after finally aiming the system while at the same time interconnecting the passageway means with the bullet accelerating and guiding passageway so that the high-temperature, pressurized gases generated by the powder of the bullet fired within the bullet accelerating and guiding passageway of the rifle are directed towards and through the passageway means for igniting the rocket motor so as to cause launching of the rocket weapon from the aimed system to impact the target.

4,593,603

ASYMMETRICALLY ACCELERATED VIBRATOR FOR FEEDING MATERIALS

Leroy A. Johnson, 105 Warren Glen Rd., Bloomsbury, N.J. 08804

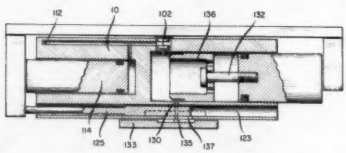
Filed Jul. 9, 1984, Ser. No. 628,769
Int. Cl.[4] F01L *15/14*; B65G *27/22*; F01B *7/18*; F15B *13/04*
U.S. Cl. 91—265 **18 Claims**

1. An asymmetrically accelerated vibrator for feeding materials comprising:

a casing;

a compressed air feed at the casing;

a first piston having a relatively small diameter and disposed in a first chamber of the casing;
an air feed connecting the feed line to the chamber of the first piston;
a second larger diameter piston disposed in a second recess of the casing and running in a direction parallel to the first piston;
a mechanical connection between the first and second piston such that those pistons move uniformly;
a support bar attached to the face of the second piston directed into the second recess;
a valve member disposed in front of the second piston dis-



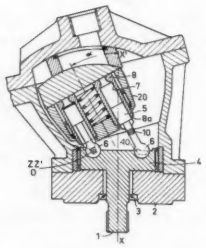
posed completely inside of the second recess and adapted to be pulled outward relative to an inner end wall of the second recess by the bar in case the second piston moves outward relative to the inner end wall of the second recess and adapted to be pushed inward relative to the inner end wall of the second recess by the head of the second piston;
an air feed connected to the feed line and to the inside area in front of the second piston which air feed is closable by the valve member in case the piston moves outwardly relative to the inner end wall of the second recess, which air feed opens when the head of the second piston presses against the valve member; and
an exhaust line for the second recess.

4,593,604

DRIVING DEVICE OF A ROTATING CYLINDER BLOCK OF A PUMP OR HYDRAULIC MOTOR

Henri Poletti, Bures sur Yvette, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 24, 1985, Ser. No. 747,903
Claims priority, application France, Jun. 22, 1984, 84 09842
Int. Cl.[4] F01B *13/04*; F04B *1/30*
U.S. Cl. 91—504 **6 Claims**



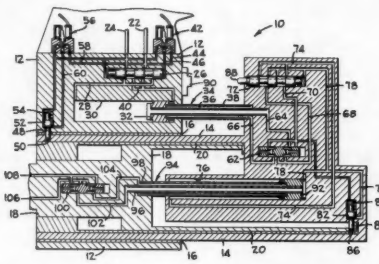
1. In a pump/motor having a cylinder block rotatable about a fixed first axis, means for driving said cylinder block, comprising:
a drive shaft rotatable about a second axis, said first and second axes being offset from one another;
a pulse plate mounted on one end of said drive shaft;
at least two pumping cylinders in said cylinder block;
pistons reciprocably movable in said pumping cylinders;
ball joint means connected to said pistons and articulated to said pulse plate; and
pairs of diametrically opposed projections fixed to said cylinder block and extending toward said pulse plate, said projections including means for resiliently engaging balls of said ball joint means, whereby upon rotation of said cylinder block and pistons, said pairs of projections sequentially engage and hold said balls so that cylinder block is sequentially articulated to said pulse plate at each of said balls.

4,593,605

FLUID POWER TRANSFER DEVICE

Bradley D. Goodell, Anoka, Minn., assignor to FMC Corporation, Chicago, Ill.

Filed Jun. 7, 1985, Ser. No. 742,241
Int. Cl.[4] F15B *13/00*
U.S. Cl. 91—528 **5 Claims**



1. A hydraulic fluid transfer arrangement comprising:
a base;
an extend tube reciprocably mounted on said base;
an extend cylinder mounted on said base and having an extend piston reciprocably retained therein adapted to extend or retract said extend tube upon the application of a high pressure to one side of said extend cylinder and a lower pressure to the other side of said extend cylinder;
a pair of concentric tubes attached to said extend piston and to said extend tube, the inner tube communicating with a first side of said extend cylinder and the outer tube with a second side;
pressure and tank passages in said extend tube;
a first shuttle valve on said extend tube with separate passages connecting said valve with said inner and outer tubes, said shuttle valve communicating said pressure and tank passages with opposite sides of said extend cylinder; and
said shuttle valve having internal ports and reaction surfaces to shift said valve so that said pressure passage is always subjected to high pressure and said tank passage is always subjected to low pressure despite shifting of the application of said high pressure from one side of said extend cylinder to the other.

4,593,606

GEAR POSITIONING CYLINDER

Alfred Klatt, Wathlingen, and Karlheinz Brinkmann, Hanover, both of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 376,469, May 10, 1982, abandoned.
This application Dec. 13, 1984, Ser. No. 681,340
Claims priority, application Fed. Rep. of Germany, May 11, 1981, 3118583
Int. Cl.[4] F01B *7/20*
U.S. Cl. 92—52 **4 Claims**

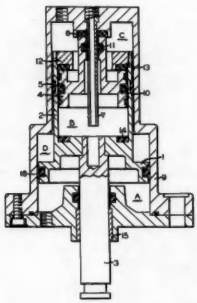
1. A gear positioning cylinder comprising:
(a) a housing;
(b) an operating cylinder formed within said housing;
(c) a main piston operably disposed in said operating cylinder and cooperating therewith to form first and second

pressure chambers on opposite sides the reof subject to the supply and release of fluid under pressure;

(d) a positioning rod fixed to one side of said main piston and projecting through said first chamber and through said housing to establish first and second positions and a third position intermediate said first and second positions;

(e) an auxiliary cylinder formed by an annular wall projecting from the other side of said main piston into the said second chamber, said auxilisay cylinder being open at the projecting end thereof and closed at the opposite end by said main piston within the areas of said annular wall, said closed end of said auxiliary cylinder providing a first stop;

(f) a closure member at said projecting end providing a second stop;



(g) an auxiliary piston operably disposed in said auxiliary cylinder for movement between said first and second stops, said auxiliary piston having a central portion projecting from one side thereof through an opening in said closure member when said auxiliary piston is in engagement with said second stop; and

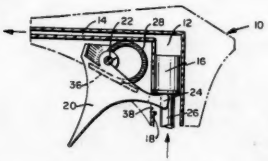
(h) said housing providing a third stop with which said projecting central portion of said auxiliary piston is engageable, said positioning rod being in said first position when said auxiliary piston is in engagement with said first and third stops, in said second position when said auxiliary piston is disengaged from said third stop and engaged with said second stop, and in said middle position when said auxiliary piston is engaged with said second and third stops.

4,593,607

SPRING-PISTON COMBINATION FOR MANUALLY OPERATED PUMP

Robert A. Bennett, Easton, Conn., assignor to Specialty Packaging Products, Inc., Richmond, Va.

Filed Feb. 28, 1985, Ser. No. 706,883
Int. Cl.[4] G01F *11/38*
U.S. Cl. 92—130 B **2 Claims**



1. A manually operated actuation for a pump comprising:

a hollow cylindrical chamber disposed vertically;

a piston vertically slidable in the chamber between a bottom position at which no pumping action can take place and a top position at which pumping action can occur;

a housing in which the chamber and the piston are disposed, said housing containing a horizontal bar;

a trigger pivotally secured in the housing and connected to the piston, the trigger having a first position at which the piston is held in its bottom position and having a second position at which the piston is held in the top position, the trigger being normally in the first position and being manually movable into the second position; and

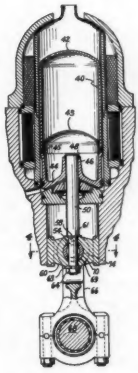
spring means constituted by a single incomplete loop having the general shape of a C, the spring means being disposed in the housing and secured to the trigger, both ends of the loop engaging the trigger, a portion of the loop intermediate the ends bearing against the bar, the spring means being spaced from the chamber and piston and biasing the trigger into the first position whenever there is no manual pressure on the trigger.

4,593,608

LIGHTWEIGHT PISTON-ROD ASSEMBLY FOR A RECIPROCATING MACHINE

John A. Corey, North Troy, and Michael M. Walsh, Schenectady, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed May 1, 1984, Ser. No. 605,782
Int. Cl.[4] F01B *31/08*
U.S. Cl. 92—176 **3 Claims**



1. In a hot gas engine, a piston-rod assembly adapted for connecting a reciprocating piston in a cylinder with a crosshead member adapted to be connected through a pivotable connecting rod to the engine crankshaft, the improvement comprising:

(a) a hollow, piston terminating at one end in a closed head portion and at the opposite end in a base portion of generally cup shape with an upwardly extending center portion having a central bore therein;

(b) a rod having a first end adapted to be disposed in the central bore of said base portion of said piston and a second end having a reduced diameter portion extending axially away from said first end and terminating at one end in a shoulder;

(c) means securing said first end of said rod in the central bore of said base portion of said piston to provide an integral, fluid-tight, radially and angularly aligned piston-rod assembly;

(d) said crosshead member having an axial bore coaxial with the line of reciprocation of said piston, a pilot bore at a first end of the crosshead member and said axial bore, and a transverse bore perpendicular to said axial bore;

(e) a cylindrical wrist pin having a transverse bore and adapted to be closely fitted wihin the transverse bore of said crosshead member with the transverse bore of the wrist pin aligned with the axial bore of said crosshead member to provide a crosshead member-wrist pin assembly for closely receiving the reduced diameter portion of said rod; and

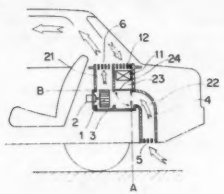
(f) means for securing said rod to said crosshead member-wrist pin assembly with a full diameter portion of said rod closely fitted within said pilot bore and with said shoulder abutting the bottom of the pilot bore at the first end of said crosshead member.

4,593,609

AUTOMOBILE VENTILATOR

Hideaki Nagatomo, and Mitsuo Yasuda, both of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,788
Claims priority, application Japan, Sep. 6, 1984, 59-135470[U]
Int. Cl.[4] B60H *3/06*
U.S. Cl. 98—2.01 **5 Claims**



1. An automobile ventilator comprising

a first passage section formed within a vehicle body, said first passage section including an air blowing passage in communication with a passenger room;

a second passage section formed within the vehicle body and in communication with said first passage section, said second passage section having a ventilating passage in communication outside the vehicle body and a circulation passage in communication with the passenger room and having an air cleaning device therein;

an impeller provided between said first passage section and said second passage section to blow air into the passenger room through said air blowing passage;

damper means provided between said impeller and said second passage section, said damper means being adapted to selectively close either one of the ventilation passage and the circulation passage;

a damper drive circuit having therein a power source, damper drive means and an ignition switch between the power source and the damper drive means, said damper drive circuit being adapted to actuate the damper drive means when said ignition switch is thrown to ON position such that the damper closes the ventilation passage and when said ignition switch is thrown to OFF position such that the damper closes the circulation passage;

a first impeller drive circuit branched off from the damper drive circuit to drive the impeller, said first impeller drive circuit having a cleaning device switch therein;

a second impeller drive circuit provided parallel to said first impeller drive circuit to drive the impeller, said second impeller drive circuit having a ventilation unit switch therein;

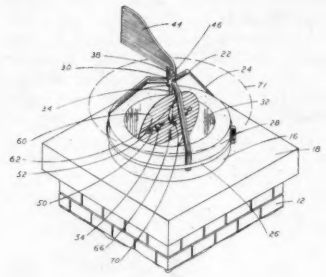
switch means provided in said second impeller drive circuit, said switch means being interlocked with said ignition switch to perform ON and OFF operations opposite to the ignition switch.

4,593,610

AUTOMATIC DAMPER FOR CHIMNEY FLUE

Paul-André Chabot, 736 Baker St., Vanier, Canada (G1M 2T9)

Filed Mar. 4, 1985, Ser. No. 708,151
Int. Cl.[4] F23L *17/02*
U.S. Cl. 98—74 **4 Claims**



1. An automatic damper for controlling the draft of a chimney flue, having a cylindrical top outlet portion, said damper, as installed on said flue, comprising a support, means securing said support to said flue, said support having a portion extending over said top outlet portion, said support consisting of an open frame to form minimum obstruction to the wind, a shaft rotatably carried by said support above said top outlet portion, extending downwardly towards said flue and substantially co-axial therewith, a weather cock fixed to the upper end of said shaft, exposed to the wind and rotating said shaft upon a change in the wind direction, a transverse generally horizontal rod fixed at its midsection to the lower end of said shaft and disposed at the level of said top outlet portion, a circular damper flap for partially closing said chimney flue, having a smaller diameter than that of said top outlet portion and pivotally carried by said transverse rod, with the center of said flap substantially coincident with the axis of said shaft, said flap defining an outer flap section and an inner flap section on opposite sides of said transverse rod, and a weight carried by said flap inner section and biasing said flap to a generally vertical position, opening said flue, and in which said outer flap section protrudes upwardly from said top outlet portion and is exposed to the wind, increasing wind velocity acting on said outer flap section causing pivoting of said flap to a progressively-horizontal position progressively closing said flue against the bias of said weight, said weather cock keeping said transverse rod in a position transverse to said wind direction, an annular gap being left between said top outlet portion and said flap when the latter reaches said substantially-horizontal position, the damper maintaining the draft in the chimney flue at an adjusted value despite varying wind velocity and wind direction.

4,593,611

VINIFICATION APPARATUS

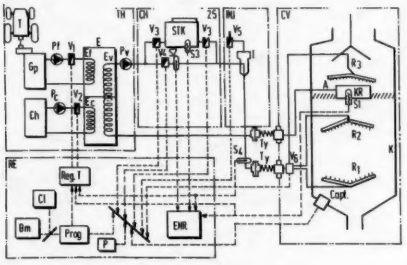
Guy Bruch, 48 rue Rosa Bonheur, 33000 Bordeaux, France

Filed Mar. 2, 1983, Ser. No. 471,466
Claims priority, application France, Mar. 12, 1982, 82 04564; Feb. 18, 1983, 83 02664
Int. Cl.[4] C12C *7/10*
U.S. Cl. 99—277.1 **39 Claims**

1. Vinification apparatus including at least one vat containing the fermenting must, at the upper level of which is formed a hat of solid components, said apparatus comprising:

(a) means for cooling and heating the contents of said vat and including a thermal exchanger connected to said vat through lines and a pumping system for drawing off at least a part of the must and, after thermal exchange, for reinjecting the must into said vat; and

(b) programmed control means for controlling said thermal exchanger and said pumping system to establish in said vat predefined temperature gradients in space and predefined temperature variations in time on the basis of temperatures



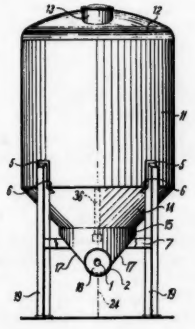
measured by a plurality of sensors disposed to measure various temperatures of the contents of said vat, whereby the quality of the produced wine may be controlled accordingly.

4,593,612

UPRIGHT RED WINE FERMENTATION TANK

Herbert Rieger, Talstrasse 33, 7121 Ingersheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 460,845, Jan. 25, 1983, abandoned. This application May 23, 1984, Ser. No. 613,149
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203161; Mar. 22, 1984, 3410458; Mar. 22, 1984, 3410459
Int. Cl.[4] C12G *1/02*
U.S. Cl. 99—277.2 45 Claims



1. A red wine fermentation tank comprising:

an upright tank having a substantially circular transverse cross-section, a longitudinal center line, a cylindrical main and middle part, a curved cover and a cone-shaped bottom part, the curved cover being positioned along the upper perimeter of the cylindrical main and middle part, and the cone-shaped bottom part being positioned along the lower perimeter of the cylindrical main and middle part; and

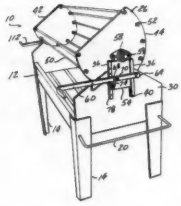
at least one agitator arranged within the tank so as to sweep through at least a substantially spherical volume, each agitator including a shaft and a rotary disc mounted on the shaft whereby the rotary disc may be rotated, the rotary disk being circular or semi-circular and substantially continuous.

4,593,613

ROTISSERIE

John H. Waltman, 3336 Bald Mountain Rd., Pontiac, Mich. 48057

Continuation-in-part of Ser. No. 531,031, Sep. 12, 1983, Pat. No. 4,505,195. This application Jul. 22, 1985, Ser. No. 757,679
Int. Cl.[4] A47J *37/04*
U.S. Cl. 99—427 15 Claims



1. A cradle for a rotisserie, said cradle comprising:

a pair of longitudinally spaced, opposite end plates;

shaft means extending longitudinally outwardly from each of said end plates;

a plurality of longitudinally extending and circumferentially spaced rods fixedly secured to said end plates;

a pair of adjacent rods being circumferentially spaced from each other a sufficient distance to define a longitudinal opening for the passage of food into the interior of said cradle;

a U-shaped member having a pair of legs; and

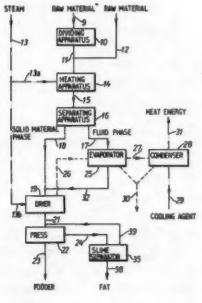
means pivotally securing said legs to one of said adjacent rods such that said member is pivotable about the longitudinal length of said one rod to open and close said longitudinal opening.

4,593,614

APPARATUS FOR THE PRODUCTION OF FODDER AND FAT FROM ANIMAL RAW MATERIALS

Odd Berge, Kuven, and Helge Hovland, Hopsvei, both of Norway, assignors to Stord Bartz A/S, Bergen, Norway

Division of Ser. No. 577,010, Feb. 6, 1984, Pat. No. 4,565,709, which is a continuation of Ser. No. 342,886, Jan. 26, 1982, abandoned. This application Jan. 23, 1985, Ser. No. 694,076
Claims priority, application Norway, Oct. 16, 1981, 813485
Int. Cl.[4] A23L *1/31*
U.S. Cl. 99—538 4 Claims



1. In a plant for processing animal raw material containing water, fat material and dry material, the combination comprising

a heating apparatus for heating the raw material;

a pressing apparatus for separating the heated material into a solid material phase and a fluid phase;

a drier for drying the solid material phase to remove water and obtain a dried product while exhausting hot waste gas;

at least one evaporation apparatus for evaporating the fluid phase to evaporate water therefrom; and

a conduit between said drier and said evaporation apparatus for delivering the hot waste gas from said drier to said evaporation apparatus for evaporating the fluid phase at least in part with the heat energy of the waste gas.

4,593,615

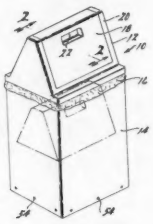
WASTE COMPACTOR APPARATUS

Charles W. Kehl, 11466 Irvington, Warren, Mich. 48093

Filed Jun. 18, 1984, Ser. No. 621,500

Int. Cl.[4] B30B *15/06*

U.S. Cl. 100—227 **20 Claims**



1. In a trash receptacle, an improved top assembly of the type having a frame attachable to the opened perimeter of a container, said top assembly pivotably mounting a door, wherein the improvement comprises;

handle means formed by said door and,

at least one releasable pivot means enabling said door to be released from pivotable engagement with said frame, such that said door may be pushed within said container thereby compressing waste material within said container, and said door thereafter being reengageable with said frame.

4,593,616

DABBER PRINTING MACHINE WITH PLURAL DABBERS

Silvano de Lorenzi, Urdorf, Switzerland, assignor to MADAG Maschinen-und Apparatebau Dietikon AG, Dietikon, Switzerland

Filed Oct. 4, 1984, Ser. No. 657,522

Claims priority, application Switzerland, Oct. 4, 1983, 5394/83

Int. Cl.[4] B41F *17/00*

U.S. Cl. 101—163 **7 Claims**

1. A dabber printing machine for printing of workpieces with printing ink, comprising:

a transfer element for moving said workpieces step by step in a horizontal plane;

at least a first and second dabber;

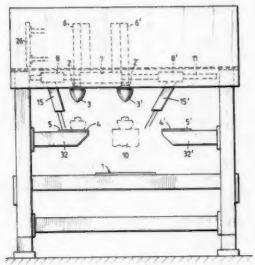
a first and second block containing said printing ink;

at least one ink trough;

an inking and doctor assembly;

first and second holder running parallel to one another and each carrying at least one of said first and second dabbers and which are jointly and simultaneously vertically and horizontally movable in a straight-lined path of an inverted U such that stepwise operation of said transfer element occurs upon every first or second horizontal movement of said first and second holders and wherein said workpieces to be printed are concentrically positioned under a straight-lined path of horizontal movement of said first and second holders; and

a first and second vertical carriage such that each of said first and second holders is fastened from below to said first and second vertical carriage, respectively; a common drive shaft; a plurality of swiveling levers pressable from above



on said first and second vertical carriages for producing downward movement of said first and second carriages; and first and second gear units placed on said common drive shaft by means of said swiveling levers.

4,593,617

INK SUPPLYING APPARATUS FOR PRINTING MACHINE

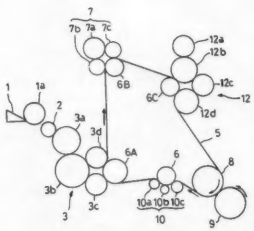
Ikkyu Morikawa, and Sinzi Morikawa, both of 79-1, Nishinouchi-cho, Kisshoin, Minami-ku, Kyoto-shi, Kyoto-fu, Japan

Filed Feb. 14, 1985, Ser. No. 701,570

Claims priority, application Japan, Feb. 17, 1984, 59-22073[U]

Int. Cl.[4] B41F *31/16, 31/14;* **B41L** *27/18*

U.S. Cl. 101—350 **2 Claims**



1. An ink supplying apparatus for a printing machine for transferring ink from an ink fountain to a plate cylinder, comprising:

an ink lifter roller disposed adjacent the ink fountain,

a first group of distributor rollers continuous from the lifter roller and rotatable in contact with one another,

a pressing cylinder opposed to the plate cylinder,

endless belt means extending between the pressing cylinder and the plate cylinder and in contact therewith, with the endless belt means contacting at least one roller in the first group of distributor rollers,

second and third groups of distributor rollers disposed downstream of the first group of distributor rollers and upstream of the pressing cylinder with respect to movement of the endless belt means, said second and third groups each including at least first and second distributor rollers directly contacting the endless belt means and at least a third roller contacting said first and second rollers without directly contacting the endless belt means, said third roller in said second and third groups of distributor rollers being slidable along its axis while in rotation, and

a fourth group of distributor rollers disposed in contact with

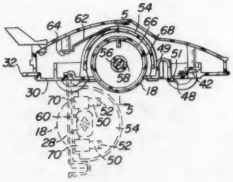
the endless belt means and positioned downstream of the pressing cylinder with respect to movement of the endless belt means and including at least one roller directly contacting the endless belt means and slidable along its axis while in rotation.

4,593,618

TOY VEHICLE WITH STAMP

Steven Lebensfeld, New York, N.Y., assignor to H-G Toys, Inc., Long Beach, N.Y.

Filed Feb. 19, 1985, Ser. No. 703,145
Int. Cl.[4] B41F *13/10*
U.S. Cl. 101—375 **13 Claims**



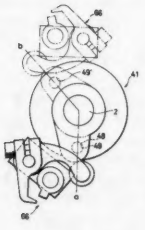
1. A toy vehicle comprising a body housing, front and rear wheels mounted on said body housing, an undercarriage secured to said body housing, a roll support member pivotably coupled to the undercarriage and latchable thereto, said roll support member including a shaft upstanding from said member and a roll cover slideably mounted on said shaft, an applicator roll supported for rotation about a horizontal axis, means for supporting said applicator roll for rotation about said horizontal axis, and means for selectively displacing said applicator roll between operative and inoperative positions.

4,593,619

MULTI-POSITION SPRING LOADED TIMING CAM FOR SHEET RELEASE GRIPPERS

Koji Ishii, and Kenso Maehara, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Division of Ser. No. 695,325, Jan. 28, 1985. This application Sep. 16, 1985, Ser. No. 776,717
Claims priority, application Japan, Jan. 30, 1984, 59-12583[U]
Int. Cl.[4] B41F *1/30*
U.S. Cl. 101—409 **4 Claims**



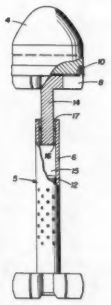
1. A sheet delivery mechanism for an offset printing press, comprising: a sprocket shaft, a cam holder nonrotatably and axially immovably disposed over said sprocket shaft, a gripper, a sheet delivery cam rotatably and axially movably fitted on said cam holder for opening and closing said gripper, and means for providing a spring force to urge said sheet delivery cam against a flange of said cam holder, said sheet delivery cam and said cam holder flange together defining a single projection and plural recesses angularly spaced by a predetermined angle, said projection being selectively engageable in said recesses to determine a timing of releasing a sheet from said gripper.

4,593,620

PROPELLANT CHARGE COMPONENT FOR USE WITH A PROJECTILE FOR MUZZLE-LOADED WEAPONS

Rolf Pettersson, Ärla, and Claes Tisell, Eskilstuna, both of Sweden, assignors to Affärsverket FFV, Eskilstuna, Sweden

PCT No. PCT/SE84/00042, § 371 Date Aug. 6, 1984, § 102(e) Date Aug. 6, 1984, PCT Pub. No. WO84/03141, PCT Pub. Date Aug. 16, 1984
PCT Filed Feb. 9, 1984, Ser. No. 638,469
Claims priority, application Sweden, Feb. 9, 1983, 8300664
Int. Cl.[4] F42B *13/22*
U.S. Cl. 102—372 **2 Claims**



1. Propellant charge component (5) for use with a projectile (4) for muzzle-loaded weapons, said propellant charge component (5) exhibiting a space (15) inside which an element (14) is capable under the effect of gases from the propellant charge component (5) of being displaced over a certain distance in the direction of firing of the projectile (4) until it comes up against a stop organ (17) arranged on the propellant charge component (5), whereby the impact against the stop will impart kinetic energy to the propellant charge component (5) causing it to be ejected from the weapon, characterised in that the propellant charge component (5) is so arranged as also to give off gas into a space surrounding the propellant charge component in the barrel (1) of the weapon, so that a gas pressure acting upon the rear part of the projectile can be built up in the last-mentioned space for the purpose of causing the projectile to accelerate from the barrel at the same time as said element (14) describes said movement in the first-mentioned space (15).

4,593,621

CARTRIDGE ASSEMBLY

Delmer B. Buchner, 16 Dubois Rd., Warren, N.J. 07060

Division of Ser. No. 651,299, Sep. 17, 1984, Pat. No. 4,565,131. This application Sep. 9, 1985, Ser. No. 773,644
Int. Cl.[4] F42B *5/02, 8/00, 5/30*
U.S. Cl. 102—430 **5 Claims**

1. A cartridge assembly including a cartridge-base having mounted thereon a plastic envelope, said cartridge-base comprising polycarbonate in a range of about 65% by weight to about 90% by weight and polyethylene in an amount in a range of from about 15% by weight top about 30% by weight admixed and compressed as a unit, shaped as a cartridge-base, and

said plastic envelope comprising a major amount of high-density polyethylene, said major amount being sufficient to impart reliable durability to the envelope when subjected to firing, said plastic envelope having a bottom open-end of inside diameter of predetermined dimension such that the plastic envelope receives and mounts a forward end of the cartridge-base within said bottom open-end, and a slug mounted within said plastic envelope.

4,593,622

INDUSTRIAL CARTRIDGE WITH SEPARATED DEFLAGRATING COMPONENTS

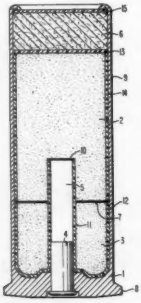
Joachim Fibranz, Fürth, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 19, 1984, Ser. No. 652,010

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334464

Int. Cl.[4] F42B *9/02*

U.S. Cl. 102—530 **11 Claims**



1. An industrial cartridge comprising a case containing a propellant charge, a base in one end of the case, and an ignition-transmitting tube arranged axially in the case, said tube being positioned on the base with an igniter arranged therein; said propellant charge being composed of at least two successively arranged propellant charge powders deflagrating at differing speeds, the powders being separated by a gas-permeable cover extending transversely to the case axis; the ignition-transmitting tube being provided with a cover at the level of the propellant charge powder which is the second and/or last charge powder as seen from the base, the cover being thinner than the wall of the ignition-transmitting tube; and the case containing, at the other end opposite to the base, a seal of a compressible material.

4,593,623

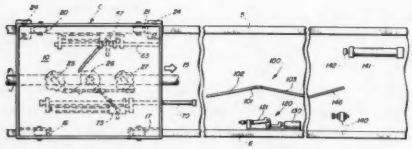
REVERSIBLE, ACCUMULATING LONGITUDINAL DRIVE TUBE CARRIER

Stanley K. Gutekunst, Nazareth; Russell H. Scheel, Easton, and Barry L. Ziegenfus, Saylorsburg, all of Pa., assignors to Heico Inc., Mendota, Ill.

Filed Apr. 10, 1984, Ser. No. 598,847

Int. Cl.[4] B61B *13/12*

U.S. Cl. 104—166 **20 Claims**



4. A carrier system having a carrier movable along a path, said carrier being operable to stop at a stop station by control of the angle of a drive wheel on the carrier relative to a rotatable member extending along said path and which imparts rotation to the drive wheel, said stop station having a deceleration-acceleration cam positioned at either side of a stop position for the carrier and a carrier stop, means on the carrier including a cam follower for changing the angle of the drive wheel as the cam follower moves along the cam, means on the carrier including a movable control member operatively connected to the drive wheel and engageable by the carrier stop to move the drive wheel to a stop position generally at a right angle to the rotatable member and to move the cam follower away from the cam.

4,593,624

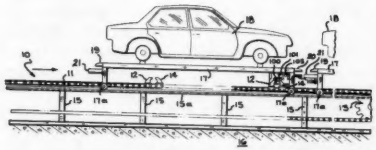
POWER AND FREE CONVEYOR

Michael G. Spiker, Lansing, Mich., assignor to Planet Corporation, Lansing, Mich.

Filed Feb. 11, 1985, Ser. No. 700,181

Int. Cl.[4] B61B *10/02*

U.S. Cl. 104—172 B **21 Claims**



1. In a power and free conveyor of the type having a carrier supported on at least one track which is moved along the track in a forward direction by a pusher means mounted on a propelling member adjacent the track which engages a dog means on the carrier, wherein the dog means on the carrier is releasable so as to accumulate the carrier when a releasing means on the carrier engages an obstacle in the path of the carrier to release the dog means the improvement in the releasing means and dog means which comprises:

(a) a linearly moveable rod mounted on the carrier in the forward direction as the releasing means, wherein the rod moves from an extended position to a depressed position along a longitudinal axis of the rod when an obstacle is engaged by the rod;

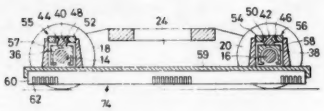
(b) dog means mounted on the carrier so as to be pivotal on a pivot axis perpendicular to the longitudinal axis of the rod, the dog means having a retaining plate extending from adjacent to the pivot axis in the forward direction and mounted on the carrier so that when the rod is in an extended position an end portion of the rod engages the retaining plate to prevent pivoting of the dog means when engaged by the pusher means and wherein when the rod is in a depressed position the retaining plate is disengaged from the end portion of the rod so that the dog means and retaining plate pivot upwards together when engaged by the pusher means and move back into position after the pusher means on the propelling member has moved ahead of the stopped carrier so that the dog means is re-engaged by a next proceding pusher means thus allowing stopping of the carrier on the track without stopping the propelling member thereby allowing accumulation of the carriers so long as the retaining plate and the end portion of the rod are disengaged; and

(c) extending means which urges the rod to the extended position when the obstacle is disengaged from the rod.

4,593,625
MOTOR VEHICLE BOGIE

Yukiaki Shimizu, and Kei Oouchi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1983, Ser. No. 521,549
Claims priority, application Japan, Aug. 9, 1982, 57-137365
Int. Cl.[4] B61F *3/00*
U.S. Cl. 105—182 R **2 Claims**

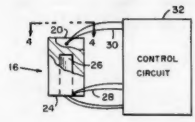


1. A bogie for a vehicle, the bogie comprising:
a linear induction motor means,
a frame means,
a plurality of shaft means having wheel means disposed at respective ends thereof,
means for rotatably mounting said shaft means to said frame means,
a pair of suspension means mounted on each of said shaft means, said pair of suspension means being respectively disposed between said linear induction motor means and the wheel means on said respective shaft means,
a substantially U-shaped cross-sectional beam means bridged between each of said pair of suspension means, each of said beam means surrounding a respective shaft means on an upper portion and two side portions thereof and being connected to each of said pair of suspension means,
means for suspending said linear induction motor means from each of said beam means including at least one universal joint means for enabling a movement of said linear induction motor means in any of three mutually perpendicular planes, each of said suspending means surrounding a respective beam means, and
said beam means supports all of the weight of said linear induction motor means through said suspending means.

4,593,626
TEMPERATURE CONTROLLED ADJUSTING MECHANISM

John Kouroupis, Baltimore, and John J. Chino, Arnold, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 25, 1984, Ser. No. 623,883
Int. Cl.[4] A47B *9/00*
U.S. Cl. 108—4 **2 Claims**

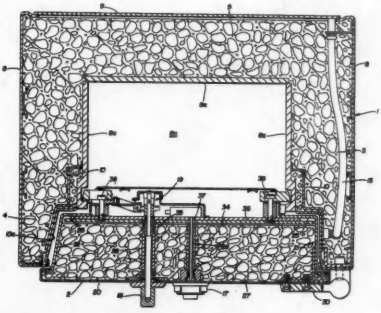


1. Mechanism for providing two degrees of angular freedom to a high resolution adjustable platform to permit precise angular adjustment thereof comprising:
a. a platform;
b. three rod members disposed for support of said platform on a surface providing a fixed reference;
c. temperature control means carried in a pair of said rod members, said temperature control means disposed for selectively controlling the temperature of said pair of rods to provide for expansion or contraction thereof, the third of said three rods being thermally stable, each of said rods being positioned adjacent to corners of said platform and said temperature controlled rods being diagonally spaced whereby selected temperature variations causes expansion and contraction of the pair of rod members thereby causing precise angular adjustment of the platform.

4,593,627
BURGLARY ATTACK RESISTANT MONEY SAFE HIGH FIBER CONCRETE REINFORCED METAL ENCASED WALL AND DOOR CONSTRUCTION AND MANUFACTURE

David R. Lankard, Columbus, and James D. Shoop, Canton, both of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed May 25, 1983, Ser. No. 497,824
Int. Cl.[3] E04B *2/02*
U.S. Cl. 109—83 **13 Claims**

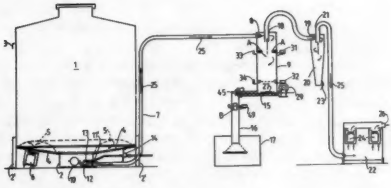


1. A burglary resistant safe enclosure comprising a plurality of walls; a compartment within said walls; and an opening for access to said compartment through said walls; wherein said walls are comprised of a composite material having a concrete phase reinforced with metal fiber and ceramic aggregate phases, said material having a metal fiber phase of 5% to 10% by volume, a concrete phase consisting essentially of Portland cement, water and superplasticizing admixture, and a ceramic aggregate phase having a maximum particle size of $1\frac{1}{2}$" to 4".

4,593,628
HEATING UNIT

Donald D. Henry, 290 Wainoni Road, Christchurch, New Zealand

Continuation-in-part of Ser. No. 595,679, Apr. 2, 1984, abandoned. This application Jan. 29, 1985, Ser. No. 696,113
Int. Cl.[4] F23K *3/14*
U.S. Cl. 110—101 R **19 Claims**



1. An apparatus for supplying fuel to a heating unit comprising:
a fuel material storage silo;
a concave base in said silo;

a silo outlet port in the central portion of said concave base;
an inflatable floor liner on said concave base for loosening material stored thereon by inflating said liner;
a feed tube having one end thereof connected to said outlet port;
a combustion chamber;
a fuel supply chamber operatively connected to said combustion chamber for feeding fuel material therein to the combustion space of said combustion chamber;
said feed tube having another end connected to said fuel supply chamber; and
a suction device operatively connected to said fuel supply chamber for drawing fuel material from said silo through said feed tube to said supply chamber.

4,593,629

SOLID FUEL STOKER

Marianne G. Pedersen, Örum, Denmark, and Michael Vaughan, Co. Meath, Ireland, assignors to Maskinfabrikken Dan-Trim ApS, Viborg, Denmark

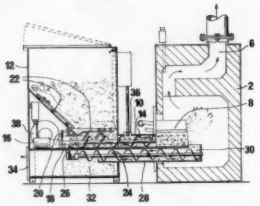
PCT No. PCT/DK83/00114, § 371 Date Jul. 31, 1984, § 102(e) Date Jul. 31, 1984, PCT Pub. No. WO84/02385, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 7, 1983, Ser. No. 638,968

Claims priority, application Denmark, Dec. 8, 1982, 5443/82

Int. Cl.⁴ F23J *1/02*

U.S. Cl. 110—172 **3 Claims**



1. A solid fuel stoker adapted to be mounted at a front of a furnace, the stoker comprising a stoker hearth and a conveyor means for supplying fuel thereto, the hearth being tunnel shaped and having combustion air inlet holes in an interior wall portion thereof, characterized in that a top portion of the hearth consists of a fire resistant ceramic material of a considerable wall thickness, and in that the combustion air inlet holes are provided solely in the lower portion of the hearth.

4,593,630

APPARATUS FOR FLUIDIZING A PARTICULATE MATERIAL IN A CONVEYING GAS

Bard C. Teigen, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 13, 1984, Ser. No. 670,730

Int. Cl.⁴ F23G *7/00*

U.S. Cl. 110—245 **1 Claim**

1. An apparatus for fluidizing a particulate material for transport in a conveying gas comprising:

a. a vertically disposed housing defining a chamber therein;

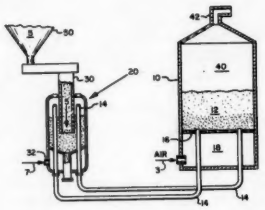
b. a perforatd bed support plate having gas flow passages therethrough, said bed support plate disposed within said housing so as to extend across said housing thereby dividing said chamber into a gas plenum beneath said bed support plate and a particulate fluidizing plenum above said bed support plate;

c. particulate feed means opening into the particulate fluidizing plenum so as to deposit particulate material onto said bed support plate;

d. gas supply means opening into said gas plenum for conveying pressurized conveying gas to said gas plenum to pass therefrom through the gas flow passages in said bed support plate whereby a portion of the particulate material fed to the fludizing plenum is fluidized so as to establish a descrete bed of fluidized material adjacent to said bed support plate and a splash zone within said fluidizing plenum above said discrete bed;

e. a plurality of transport conduits, each penetrating said housing and having an inlet opening into the splash zone for receiving particulate material and conveying gas therefrom and conveying said received particulate material from said housing in the conveying gas; and

f. orificing nipple means mounted to the inlet of at least one of said plurality of transport concuits, said orificing nipple means having a nipple a body adapted to mount to the inlet or a transport conduit, said nipple body having an



inlet opening to the splash zone of the fluidizing plenum and an outlet opening to the inlet of the transport conduits associated therewith, the inlet to said nipple body having a cross-sectional area less than the cross-sectional area of the inlet to the transport conduit associated therewith, said nipple body defining a diverging flow passageway therethrough from the inlet of the nipple body to the outlet of the nipple body, said nipple body comprising an open-ended frustrum-shaped shell having a base with a cross-sectional shape adapted to mate with the transport conduit to which it is mounted, and a sleeve extending outwardly from the base of the frustrum-shaped shell, the sleeve adapted for insertion into the inlet of the transport conduit to which it is mounted so as to provide a slip-fit mounting therewith.

4,593,631

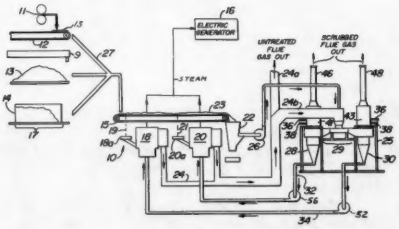
ORGANIC FIBROUS MATERIAL PROCESSING APPARATUS AND SYSTEM

Gurdon B. Wattles, North Haven, and Donald L. Pihl, Guilford, both of Conn., assignors to Safety Railway Service Corporation, New Haven, Conn.

Continuation of Ser. No. 150,918, May 19, 1980, abandoned, which is a continuation of Ser. No. 900,150, Apr. 26, 1978, abandoned. This application Oct. 15, 1981, Ser. No. 311,750

Int. Cl.⁴ F23J *11/00*

U.S. Cl. 110—345 **8 Claims**



1. A method of processing fibrous organic material comprising:

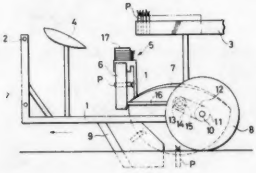
(a) centrifugally impacting said materials by feeding them centrally within a processing zone whence they are flung outwardly by centrifugal force against impactors in an atmosphere which principally comprises substantially all of the gas exhausted from a combustion zone,
(b) applying said impacted material entrained in said gas to a separation zone wherein said material is separated from said gas, said zone being energized and operated substantially only by the fluid energy of said gas, and
(c) applying said separated material as a fuel for said combustion zone.

4,593,632

TRANSPLANTER PROVIDED WITH SEEDLINGS SELECTOR

Isao Mikawa; Masahiro Endoh; Masayuki Kaji; Yoshitaka Kishida, and Nobuhiro Yamamoto, all of Takikawa, Japan, assignors to Circle Iron Work Co., Ltd., Hokkaido, Japan

Filed Jul. 30, 1984, Ser. No. 635,585
Claims priority, application Japan, Jul. 29, 1983, 58-117319[U]
Int. Cl.⁴ A01C *11/02*
U.S. Cl. 111—3 **4 Claims**



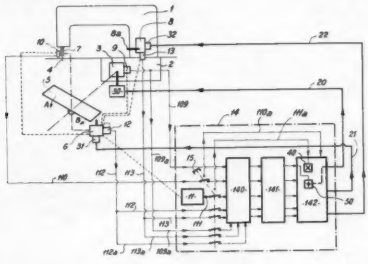
1. A transplanter having a planting disc and a seedling selector, said seedling selector comprising:
a supplying conveyor upon which a row of paper tube seedlings may be placed;
a transfer means for transferring such seedlings to said planting disc;
selecting and arraying conveyor means positioned for receiving seedlings from said supplying conveyor, and including means for selecting out inferior seedlings, arraying remaining individual seedlings and moving said remaining seedlings towards said transfer means;
controlling conveyor means positioned for receiving individual seedlings from said selecting and arraying conveyor means and moving said seedlings towards said transfer means;
accumulating conveyor means positioned for receiving individual seedlings from said controlling conveyor means, and including means for accumulating said individual seedlings and delivering said individual seedlings to said transfer means;
seedling accumulation detector means associated with said controlling conveyor means for detecting an accumulation of a selecting number of said individual seedlings on said controlling conveyor means;
means for moving said supplying, separating and arraying, controlling and accumulating conveyor means at predetermined speeds; and
means responsive to said detector means for slowing said means for moving said supplying conveyor at times only when said accumulation of said selected number is detected by said detector;
whereby an accumulation of said seedlings is not permitted to increase beyond said selected number.

4,593,633

PROCESS FOR AT LEAST PARTLY AUTOMATING SEWING OPERATIONS AND SEWING MACHINE THEREFOR

Charly Leclaire, Dourges, France, assignor to Prouvost S.A., Nord, France

Filed Jan. 13, 1984, Ser. No. 570,372
Claims priority, application France, Jan. 17, 1983, 83 00605
Int. Cl.⁴ D05B *19/00*
U.S. Cl. 112—121.11 **10 Claims**



6. In a partially automatic sewing machine including:
a drive motor mechanism in fixed relationship to a needle and to a fabric feed system,
a stepwise speed control device for controlling the said mechanism,
a sewing foot and its control element,
a sensor for sensing the length of material passing under the needle,
and situated near the needle,
a sensor for sensing the position of the abovementioned speed control, and
a clock,
the improvement comprising means for enabling a recording phase for the sewing operation to be effected in automatic fashion without operator intervention and a subsequent reproduction phase to be effected in which said sewing is reproduced in repetitive fashion, said means including:
an automatic actuator element for the abovementioned speed control device,
an automatic actuation element for the sewing foot control, and
a treatment device for treating the signals emitted by each of the said sensors and the clock for
(a) recording their instantaneous value at each change in position of the speed control element during the recording phase,
(b) establishing a comparison between these recorded signals and the signals emitted during the reproduction phase, and
(c) controlling, as a function of the results of the comparison, the abovementioned automatic actuation element of the speed control device.

4,593,634

APPARATUS AND METHOD FOR JOINING THE PARTS OF SHOE UPPERS BY STITCHING

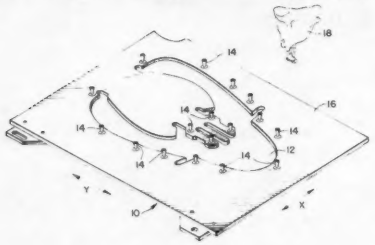
Rodolfo Moreno, Miami Lakes, Fla., assignor to Suave Shoe Corporation, Miami Lakes, Fla.

Filed Oct. 11, 1984, Ser. No. 659,706
Int. Cl.⁴ D05B *21/00*
U.S. Cl. 112—262.3 **5 Claims**

1. A support for a workpiece composed of separate parts of flexible sheet material to be joined by stitching, comprising a sewing plate having an opening shaped to permit stitching therethrough in accordance with a predetermined pattern, said plate having a plurality of pins projecting outwardly from one face thereof at positions spaced about said opening, said plate

being devoid of a cover, whereby said parts of said workpiece may be pressed over said pins to locate and hold the parts during stitching, with certain parts superposed, and without the need for sandwiching the parts between said plate and a cover.

3. A method of joining parts of flexible sheet material, comprising providing a support plate having an opening to accommodate stitching therethrough and having pins projecting



outwardly from one face of the plate at positions spaced about the opening, providing said parts of flexible sheet material with slits, without removal of material, at positions corresponding to the positions of associated pins, pressing said slits over the associated pins to position said parts on said plate and to superpose certain parts, joining the superposed parts by stitching through said opening with said parts exposed at said face of said support plate and substantially uncovered, and removing the joined parts from said support plate.

4,593,635

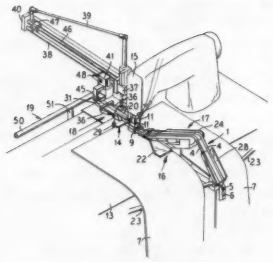
METHOD AND APPARATUS FOR SEWING A SLIDE FASTENER TO FABRIC PIECES

Ronald J. Boser, Dix Hills, N.Y., and Shigeru Tanaka, Lyndhurst, N.J., assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,727

Int. Cl.[4] D05B *3/12, 21/00, 33/02*

U.S. Cl. 112—265.2 **12 Claims**



1. A method of sewing a concealed slide fastener to a pair of fabric pieces, the concealed slide fastener including a pair of fastener stringers, each stringer including a stringer tape having an inner longitudinal edge folded on itself supporting a row of coupling elements attached to the tape edge, there being a slider slidable on and along the fastener stringers for opening and closing the slide fastener, said method comprising the steps of:

(a) supplying the pair of fabric pieces to a sewing station defined by a sewing machine;

(b) uncoupling the pair of fastener stringers by moving the slider to a bottom end portion of the concealed slide fastener;

(c) introducing the uncoupled pair of fastener stringers, as superimposed over the respective fabric pieces, to the sewing station from a top end portion of the slide fastener, while turning the pair of fastener stringers upside down so that the stringers assume twisted positions in mirror symmetry with respect to the longitudinal centerline of the slide fastener;

(d) sewing the pair of fastener stringers to the respective fabric pieces from the top end portion of the slide fastener in the sewing station;

(e) drawing the concealed slide fastener by the top end thereof, with the pair of fabric pieces sewn thereto, forwardly from the sewing station, as said sewing progresses;

(f) terminating said sewing when the bottom end portion of the slide fastener approaches the sewing station;

(g) upon termination of said sewing, at least partially coupling the pair of fastener stringers to close the slide fastener by moving the slider from the bottom end portion of the slide fastener into the region where each fastener stringer is sewn to the respective fabric piece; and

(h) finally, discharging the closed slide fastener, with the pair of fabric pieces sewn thereto.

2. An apparatus for sewing a concealed slide fastener to a pair of fabric pieces, the concealed slide fastener including a pair of fastener stringers, each stringer including a stringer tape having an inner longitudinal edge folded on itself supporting a row of coupling elements attached to the tape edge, there being a slider slidable on and along the pair of fastener stringers for opening and closing the slide fastener, said apparatus comprising:

(a) a table;

(b) a sewing station defined by a double-needle sewing machine mounted on said table for receiving the slide fastener stringers and the pair of fabric pieces in respective superimposed relationship;

(c) a first guide disposed upstream of said sewing station for guiding the pair of fabric pieces in laterally spaced relation to said sewing station;

(d) a second guide supported on said table and disposed above said first guide for supporting the concealed slide fastener with the pair of fastener stringers uncoupled, and for guiding the uncoupled pair of fastener stringers to said sewing station so as to turn the stringers upside down so that the stringers assume twisted positions in mirror symmetry with respect to the longitudinal centerline of the slide fastener;

(e) a gripper mechanism disposed downstream of said sewing station and reciprocable along a substantially horizontal first path, between an upstream position and a downstream position, for gripping and drawing the slide fastener, with the pair of fabric pieces sewn thereto, from said sewing station; and

(f) a slider-moving unit disposed downstream of said sewing station and reciprocable, along a second path parallel to said first path, for moving the slider on the pair of fastener stringers from the bottom end portion of the slide fastener into the region where each fastener stringer is sewn to the respective fabric piece, said slider-moving unit being retractable from said second path so as not to obstruct the movement of said fabric pieces along said first path.

4,593,636

SEWING MACHINE WITH APPARATUS FOR SEWING A CURVED SEAM

Helmut Schips, Steinacherstrasse 340, CH-9327 Tübach, Switzerland

Filed Jun. 20, 1985, Ser. No. 746,722

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 3423239

Int. Cl.[4] D05B *21/00, 35/10*

U.S. Cl. 112—308 **18 Claims**

1. A sewing machine, comprising:

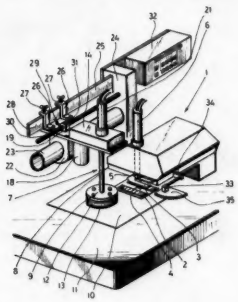
a sewing needle:

first means for transporting material to be sewn, the transporting means having a transporter acting on one side of the material to be sewn and a presser foot which can be

placed on the other side of the material to be sewn in the effective area of the transporter;

second means for transporting the material to be sewn which can be switched from an ineffective condition into an effective condition and vice versa;

said second transporting means including a transport element rotatable about an axis parallel to and at a distance from the longitudinal axis of the sewing needle which in the effective condition takes hold of the material to be sewn at a distance from and adjacent the first transporting



means by being placed on the material on the same side as the pressure foot and rotates about the rotational axis of the transport element; and

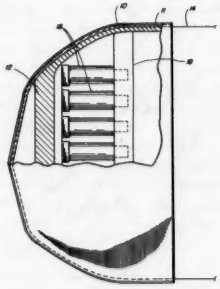
a control device, which, during the sewing of a circular curved seam to be produced with the aid of the second transport device, holds the first transport device in an ineffective condition and holds the second transport device in an effective condition, and for seams that may be produced in a different shape, holds the first transport device in an effective condition and holds the second transport device in an ineffective condition.

4,593,637

COMBINATION FRANGIBLE NOSE CAP EMI SHIELD

Harvey J. Klee, Lakeside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 4, 1984, Ser. No. 616,866
Int. Cl.[4] F42B *19/46*
U.S. Cl. 114—20 R **5 Claims**



1. An improved frangible nose cap for a torpedo containing grounded electronics within its body which further comprises:

means for electrically shielding the electronics contained within the torpedo body from electromagnetic interference, said means made a part of the frangible nose cap; and

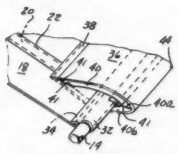
means for electrically connecting the shielding means to the body of the torpedo and to the electronics system's ground.

4,593,638

ARRANGEMENT AND METHOD FOR ACHIEVING AN AERODYNAMIC MAST PROFILE FOR SAILCRAFT

Steven M. Cochran, 4916 Mansfield, Royal Oak, Mich. 48083, and Mark J. Murphy, 1228 Oakwood Ct., Rochester, Mich. 48063

Filed Dec. 31, 1984, Ser. No. 687,993
Int. Cl.[4] B63H *9/08*
U.S. Cl. 114—39 **16 Claims**



1. An arrangement for achieving an aerodynamic shape for a mast and adjacent main sail areas of a sailing craft, comprising:

an outer profile sleeve of flexible material secured along the luff of said sail, extending from a line of attachment spaced inwardly from the luff of the sail and extending forwardly of and around the mast;

one or more pairs of profile members tightly fit into said profile sleeve while allowing clearance of said mast therebetween, said one or more profile members and said profile sleeve assembled together onto said mast with said profile members extending on either side of said mast and forming an aerodynamic shape, extending around and along the length of said mast, transitioning into the main area of said sail;

said one or more pairs of profile members each formed of a pair of flat sections of semi-rigid, resilient material each bent into a curved shape with a space therebetween by the constraint of said profile sleeve and passage of said mast therebetween separating said profile members and stretching said profile sleeve into said aerodynamic shape.

4,593,639

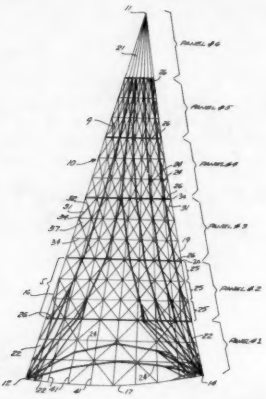
METHOD OF STRESS DISTRIBUTION IN A SAIL AND SAIL CONSTRUCTION

Peter G. Conrad, Old Lyme, Conn., assignor to Sobstad Sailmakers, Inc., Old Saybrook, Conn.

Filed Dec. 14, 1984, Ser. No. 681,933
Int. Cl.[4] B63H *9/06*
U.S. Cl. 114—103 **21 Claims**

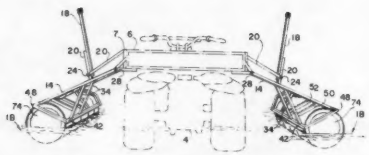
1. As an article of manufacture, a pliant lifting surface such as a sail, comprising at least one continuous skin member of a plurality of panels, a plurality of flat pliant grid members across said panel and integrally and adheringly with said skin member, said grid members defining a lattice work pattern on said skin member; interconnectingly with adjoining panels, as load bearing members for said lifting surface, a plurality of pliant flat structural members interconnectingly with said panels for load bearing with said skin member and with said grid members, said plurality of structural members, interconnectingly

joining said panels and projecting radiatingly outwardly into said lifting surface and securedly into point load locations for



said lifting surface and joining together at least two point load locations for said lifting surface.

4,593,640
THREE WHEELER MOBILE PONTOONS
Paul A. Blunschi, P.O. Box 231, Sicily Island, La. 71368
Filed Aug. 29, 1984, Ser. No. 645,272
Int. Cl.[4] B63B *43/14*
U.S. Cl. 114—123 **7 Claims**



1. A flotation structure for adapting a three-wheel motorcycle to travel upon water and stabilizing its position during water travel, comprising:

(a) attachment means for supportively mounting said flotation structure to an aft frame of the motorcycle;

(b) a first and second flotation support means, pivotally connected to said attachment means, extending laterally from a first side of said attachment means and adapted to be hand-operated between a first, uppermost position, a third lowermost position and a second intermediate position, wherein each of said flotation support means further comprises:

(i) an upper eccentric lever arm pivotally connected, at one end, to said attachment means;

(ii) a lower eccentric lever arm pivotally connected, at one end, to said attachment means a distance below said upper eccentric lever arm;

(iii) a forward angle support brace pivotally connected to the lower eccentric lever arm at one end, and fixedly attached at the second end to the buoyancy means;

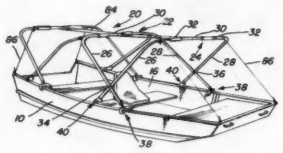
(iv) an aft angle support brace pivotally connected at one end to the attachment means and fixedly attached at the second end to the buoyancy means;

(v) a handle means pivotally connected to the second end of the upper eccentric lever arm, the handle means being adapted to be hand-operated to effect change of positions of the flotation support means;

(c) buoyancy means, fixedly attached to each of said support means, adapted to floatingly displace the weight of said motorcycle;

(d) locking means for locking each of said flotation support means in each of said first, second and third positions.

4,593,641
UNIVERSAL FRAME FOR BOAT MOUNTED GAME BLIND
Charles C. Adams, 243 N. Avalon, Memphis, Tenn. 38112, and Charles H. Dickas, III, Rte. 1, Box 130, Shady Point, Okla. 74956
Filed Aug. 7, 1984, Ser. No. 638,393
Int. Cl.[4] B63B *17/00*
U.S. Cl. 114—343 **3 Claims**



1. A collapsible frame for a hunting blind for mounting on a small boat having gunwales on the port and starboard sides, said frame including a pair of substantially U-shaped tubular members including a central cross bar and a pair of arms for spanning the boat from the port to the starboard sides, means for pivotably connecting the port side arm of a first of said members to the port side arm of the second of said members and for pivotably connecting the starboard side arm of said first member to the starboard side arm of said second member, at least one universal mount on each of said sides at substantially opposite dispositions, each mount comprising a C-shaped clamp having a manually adjustable pressure plate selectively moveable along an axis of movement toward and away from a facing anvil, said plate and anvil being spaced from a central web of said clamp for clamping opposite surfaces of a respective wall of said boat between said plate and anvil with said web disposed above and spanning the gunwale, articulating linkage means having a first bracket member pivotably mounted on said web for movement about a first axis normal to said web and spaced above said axis of movement and having a second bracket member pivotably carried by said first bracket member for movement about a second axis normal to said first axis and parallel to said web, journal means for pivotably connecting the arms of a first of said U-shaped members to a respective one of said second members for supporting said first U-shaped member for pivotable movement relative to said boat, a Tee-connector at the end of each arm of said second U-shaped member for abutting the gunwale at respective sides of the boat for adjustably supporting the arms of said second U-shaped member spaced from the arms of said first member with said cross bars spaced above said boat such that a covering may be supported on the cross bars of said U-shaped members to conceal persons in the boat and tie means adjustably connecting the cross bar of the first member to the cross bar of the second member.

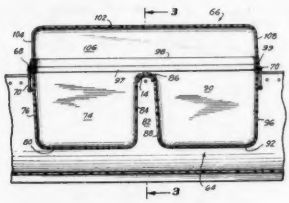
4,593,642
CARRYING CASE FOR CANOE
Charles W. Shay, 400 Shay Lane, Matamoras, Pa. 18336
Filed Nov. 28, 1984, Ser. No. 675,679
Int. Cl.[4] B63B *27/00*
U.S. Cl. 114—347 **11 Claims**

1. An improved carrying case for a canoe having a side lip and a transverse thwart which comprises:

(a) A storage container having means to allow access to the

interior thereof, the container having a transverse medial channel separably straddling the thwart and delineated by side walls and an upper cross wall, the cross wall resting on and loading the thwart;

(b) adjustable securement means to detachably secure the container within the interior of the canoe, at least one means engaging the side lip of the canoe proximate the thwart;



(c) the conatiner extending substantially above the side lip of the canoe;

whereby, the case provides a secured storage which cannot be dislodged should the canoe be subject to violent conditions, such as overturning, and the case also provides substantially improved flotation characteristics to the canoe.

4,593,643

DEVICE FOR THE APPLICATION OF IDENTIFICATION MARKS TO TUBES FOR THE WINDING OF TEXTILES

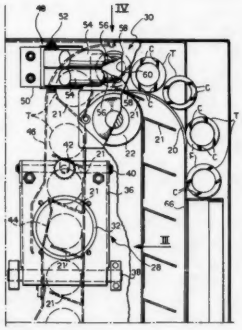
Giuseppe Saviolo, Palestro, Italy, assignor to Sant'Andrea Novara Officine Meccaniche e Fonderie S.p.A., Novara, Italy

Filed May 2, 1984, Ser. No. 606,101

Claims priority, application Italy, May 2, 1983, 67469 A/83

Int. Cl.[4] B05C *1/02*

U.S. Cl. 118—72 **3 Claims**



1. A device for the application of identification marks to tubes for the winding of textiles, comprising tube supplying means, a conveyor device for conveying individual tubes parallel to each other from said tube supply means along a predetermined path, tube marking means comprising two inking units located on opposite sides of said path for applying ink marks on opposite ends of said tubes, each of said two inking units comprising at least one wiping type ink marker resiliently biased toward said path for engagement with one end of each tube passing said marker for applying an erasable ink mark to one end of each tube.

4,593,644

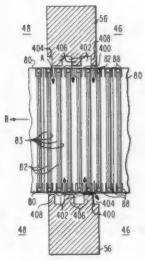
CONTINUOUS IN-LINE DEPOSITION SYSTEM

Joseph J. Hanak, Lawrenceville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 26, 1983, Ser. No. 545,741

Int. Cl.[4] C23C *14/56*

U.S. Cl. 118—719 **7 Claims**



1. A deposition system for coating films on substrates comprising:

(a) a vacuum chamber having two opposite ends arranged on a longitudinal axis of said chamber and a plurality of subchambers spaced apart along said longitudinal axis within said chamber;

(b) a transport means including a plurality of carriers for holding a plurality of said substrates euqally spaced so that a principal face of each of said substrates is substantially perpendicular to said longitudinal axis and for imparting motion to said substrates along said longitudinal axis and through each of said plurality of subchambers, each of said carriers comprising a bottom and a plurality of spaced apart substrate holders attached to said bottom and arranged in pairs so that when said one of said carriers is positioned between said two subchambers, one of each of said pairs of substrate holders is parallel to and closely adjacent a first planar surface of a first baffle and the other of each of said pairs of substrate holders is parallel to and closely adjacent a second planar surface of a second baffle;

(c) inlet means and outlet means associated with each of two of said plurality of subchambers and disposed on opposite sides of said longitudinal axis for effecting a flow of reactant gas therethrough in a direction substantially normal to said longitudinal axis of said chamber;

(d) means for activating said reactant gas to effect said coating of said films; and

(e) a means for inhibiting flow of said reactant gas from one of said two subchambers to the other of said two subchambers comprising:

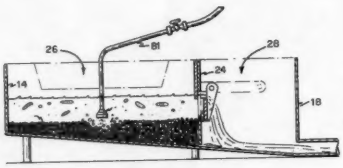
(i) a first baffle having a first planar surface and a second baffle having a second planar surface, said first and second baffles being disposed between said two subchambers on opposite sides of said longitudinal axis so that said first and second planar surfaces are opposed and substantially parallel to each other and to said longitudinal axis, wherein said first and second planar surfaces have a plurality of equally spaced vertically disposed depressions and lands formed therein, one of said lands being between each two adjacent depressions, wherein said depressions of said first planar surface are opposite to and in alignment with said lands of said second planar surface; and

(ii) means for effecting a flow of gas from one of said first and second planar surfaces to the other of said first and second planar surface.

4,593,645
METHOD AND APPARATUS FOR CLEANING A REUSABLE LITTER CONTAINED WITHIN A LITTER BOX

Hermann P. A. Dingler, 4328 Villa Dr. #2, Cincinnati, Ohio 45242

Filed May 2, 1985, Ser. No. 729,806
Int. Cl.[4] A01K *23/00*
U.S. Cl. 119—1 15 Claims



1. A method of cleaning animal excrements and other waste materials from litter within a pet litter box having first and second compartments with a gravel bed covering the floor of the first compartment, comprising steps of:

(a) directing pressurized water against the gravel bed in the first compartment to separate any fecal or other waste material from the gravel;

(b) filling the first commpartment to a first predetermined level with water and agitating the water to disperse the separated waste material into the water;

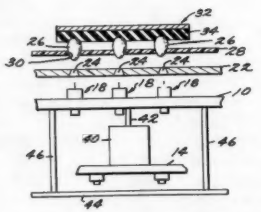
(c) rapidly abandoning lateral support of the water in the first compartment and laterally transferring the water in the first compartment to the second compartment while the dispersed waste material is dispersed in the water without transferring the gravel litter; and

(d) draining the water and waste material from the second compartment;

4,593,646
EGG INJECTION METHOD AND APPARATUS

Gary E. Miller, Fountain Valley, and Perry Sheeks, Orange, both of Calif., assignors to Agrimatic Corporation, Paramount, Calif.

Filed Jun. 1, 1982, Ser. No. 383,839
Int. Cl.[4] A01K *45/00*
U.S. Cl. 119—1 14 Claims

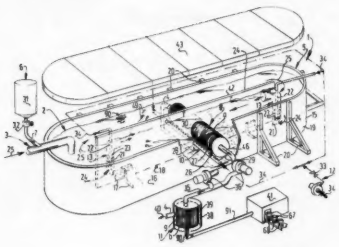


1. Egg-injection apparatus comprising: means for supporting a plurality of eggs arranged in spaced apart relationship in a common plane; a plurality of parallel laterally-spaced apart needle assemblies mounted in a support, each assembly including a needle having an open outer end and a bore through which liquid material may be passed; means for moving said needle support toward and away from said egg supporting means in a direction parallel to said needles between a first position in which the outer end of each needle pierces an egg and a second position in which the needles are retracted from the eggs; and needle-cleaning means including an elongated cleaning implement positioned within each needle assembly and means for moving the implement longitudinally in the bore of the respective needle to eject unwanted material from the outer end of the respective needle.

4,593,647
METHOD AND DEVICE OF PRODUCING ARTEMIA OFFSPRING

Patrick P. Sorgeloos, Deinze; Danny H. Versichele, Zele; Philippe P. J. M. Leger, Wervik, and Patrick A. Lavens, Tornhout, all of Belgium, assignors to Artemia N.V., Antwerp, Belgium

Filed Sep. 16, 1983, Ser. No. 532,967
Claims priority, application Netherlands, Sep. 24, 1982, 8203710
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—2 15 Claims

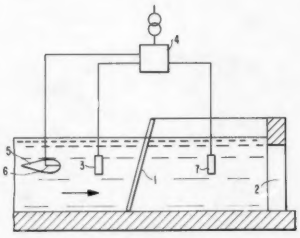


1. A method of producing Artemia offspring in which the Artemia depositing offspring are kept in an aqua-culture and the deposited offspring harvested, comprising providing said Artemia in a high density in a flowing aqua-culture under such selected conditions that the Artemia deposit only one selected type i.e. nauplii and cysts.

4,593,648
ELECTRIC FISH-REPELLING DEVICE

Werner Marzluf, Rheinstetten, Fed. Rep. of Germany, assignor to Maschinenfabrik Hellmut Geiger GmbH & Co. KG, Karlsruhe, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 602,725
Int. Cl.[4] A01M *29/00*
U.S. Cl. 119—3 6 Claims



1. In a fish repelling apparatus, particularly for use at water inlet and extraction structures, said apparatus being of the type including main and counter electrodes positioned beneath the surface of the water adjacent a structure, and a controllable impulse voltage supply unit for supplying pulsed voltage between said main and counter electrodes and thereby for generating in the water an electric field for repelling fish approaching the structure, the improvement comprising:

means, positioned in the water upstream of said main elec-

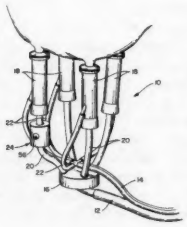
trodes, for measuring the actual electric current density of said electric field and for generating a signal representative thereof.

4,593,649

MILK MONITORING APPARATUS AND METHOD

Allan M. Britten, 6151 Hannigan Rd., Everson, Wash. 98247

Filed Feb. 14, 1984, Ser. No. 580,072
Int. Cl.[4] A01J *7/00*
U.S. Cl. 119—14.08 **24 Claims**



1. An apparatus to monitor a characteristic of milk that is taken from an animal, said apparatus being adapted to be used in conjunction with a milking device that extracts the milk from the animal, said apparatus comprising:

(a) a housing adapted to be mounted relative to shid milking device so as to have a first operating position where the housing has a first postitional orientation when the milking device is in use, and a second non-operating position where the housing has a second positional orientation when the milking device is not in use;

(b) a sensing means adapted to sense a predetermined condition of said characteristic of the milk and transmit a condition signal related to said condition;

(c) indicating means to provide an indicating output of the condition of the characteristic of the milk;

(d) a control means to receive said condition signal and to cause said indicating means to provide its output in accordance with said condition signal;

(e) switch means responsive to the positional orientation of said housing to cause said apparatus to be operational when said housing is in its first position and and to cause said apparatus to be non-operational when said housing is in its second position;

(f) said control means comprising circuit means to generate an activating signal at a first time and further comprising signal storing means to store said activating signal so as to delay transmittal of the same, and to transmit said activating signal to said indicating means at a subsequent time, said storage means being responsive to said switch means being activated by said housing being moved to its first position subsequent to said activating signal being stored in said storage means, whereby said activating signal is transmitted to said activating means upon a subsequent operation of said apparatus by said housing being moved to its first position subsequent to an initial operation of said switch means.

4,593,650

ANIMAL CAGE AND METHOD

Charles P. Lattuada, Burlington, N.C., assignor to Granite Technological Enterprises, Inc., Burlington, N.C.

Filed Feb. 25, 1985, Ser. No. 704,874
Int. Cl.[4] A01K *1/03*
U.S. Cl. 119—15 **3 Claims**

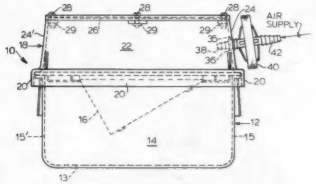
1. A portable environmental chamber for caging mice or other small experimental animals, comprising:

(a) a bottom section formed of transparent plastic material as an open top tray with a rectangular bottom wall for receiving animal bedding material and four side walls extending vertically upward therefrom and terminating in a top peripheral edge and including a bar cover supported by and within said bottom section above said bottom wall;

(b) a top section formed of transparent plastic materials as an open bottom tray with a perforate rectangular top wall and four side walls extending downwardly and depending from said top wall and having an outwardly flared formed peripheral bottom edge loosely resting upon said bottom section side wall top peripheral edge in substantially air-sealed relation;

(c) a rectangular disposable filter sheet fitted and removably secured to said top section perforate top wall for filtering both pressurized air and gases generated within said chamber and passing outwardly therefrom;

(d) an auxiliary filter support mounted in a selected said top section side wall and having an inlet external of said selected side wall and an outlet internal of said selected side wall;



(e) an auxiliary sterile filter loosely and removably supported in said auxiliary filter support between said inlet and outlet enabling air forced therethrough into said chamber to be filtered; and

(f) a source of pressurized air adapted for being removably connected to said auxiliary filter inlet,

whereby when said top section is placed on said bottom section with said top section peripheral edge in said sealed relation with said bottom section peripheral edge and said pressurized air source is disconnected, said air filter sheet provides static filtration of and permits gases generated within said chamber to diffuse outwardly through said filter sheet to leave said chamber and external unpressurized air to diffuse through said filter sheet into said chamber and when said pressurized air source is connected, a forced circulation is established above said bottom section and through said sterile filter and air filter sheet permitting only the exhausting of air and gases from said chamber and simultaneously drying of said bedding.

4,593,651

LIVESTOCK FEED CONVEYOR INCLUDING PROVISION FOR MULTIPLE FEEDER BUNKS

Michael D. McCarthy, New Holstein, and Keith H. Rhodes, Winneconne, both of Wis., assignors to Metko, Inc., New Holstein, Wis.

Filed Oct. 9, 1984, Ser. No. 659,171
Int. Cl.[4] A01K *5/02;* **B65G** *47/46*
U.S. Cl. 119—52 B **43 Claims**

1. A feed conveyor for depositing livestock feed uniformly in one or more feeder bunks, comprising:

conveyor means including a conveyor belt having an upper support surface and driving means for driving said conveyor belt;

means for supporting said conveyor means generally over the feeder bunks;

means for depositing livestock feed on the upper support surface of said conveyor means; and

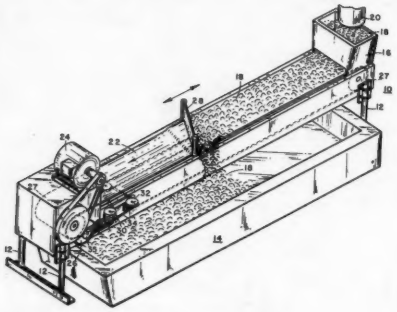
means for plowing feed off the upper support surface of said conveyor means and into the feeder bunk, including:

a plow having at least two blade surfaces resting on the upper support surface of said conveyor belt, said two

blades joined to form a point at one end and separated by separation means at the opposite end to greater than the width of said conveyor means;

trolley means positioned directly under said plow and the surface of said conveyor belt and connected to said plow for moving said plow back and forth along the length of said conveyor belt;

cable means attached to said trolley and reeved about two cable pulleys, one disposed at each end of said conveyor means, said cable means and cable pulleys positioned below said trolley but above the lower return surface of said conveyor belt, and the two flights of said cable means and cable pulleys oriented in a horizontal plane, one of said cable pulleys being driven by the same driving means which drives said conveyor means;



wherein said plow is pivotably connected to a plate which in turn connects to said trolley means and including over-center means for holding the point of said plow toward the nearest side of said conveyor belt;

further comprising means for switching the point of said plow to the opposite side of said conveyor belt;

wherein the blade of said plow opposite the side toward which the point of said plow points protrudes beyond the side of said conveyor means and wherein said point moving means includes a latch attached to one side of said conveyor which can be raised so as to contact said protruding portion of said plow blade such that said plow pivots and said plow point switches to the opposite side of said conveyor belt.

4,593,652

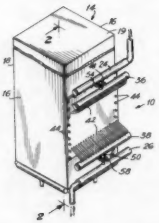
MODULAR TUBE UNIT FOR FLUIDIZED BED BOILERS

Saul Ehrlich, 15 Clark St., Brooklyn, N.Y. 11201

Filed Dec. 21, 1984, Ser. No. 684,500

Int. Cl.[4] F22B *1/00*

U.S. Cl. 122—4 D **12 Claims**



1. An in-bed tube system for a fluidized bed boiler, comprising, in combination,

at least one fluidized-bed boiler forming a combustion chamber containing said fluidized bed and having a front wall forming an opening to said fluidized bed,

a source of boiler feed fluid,

a feed fluid line proximate to said front wall and connected to said source of feed fluid,

a steam line proximate to said front wall,

tube means mounted to said front wall at said opening, positioned in said fluidized bed, and connected to said feed fluid line and to said steam line, said tube means being for passing said feed fluid from said feed fluid pipes into said fluidized bed for conversion to steam, and for passing said steam from said fluidized bed to said steam line,

mounting means for quickly attaching and detaching said tube means to and from said front wall of said boiler,

first connecting means positioned between said tube means and said feed fluid line for quickly attaching and detaching said tube means to and from said feed fluid line,

connecting means positioned between said tube means and said steam line for quickly attaching and detaching said tube means to and from said steam line;

said tube means including an inlet feed fluid manifold connected to said feed fluid line, an outlet steam manifold connected to said steam line, a cover member capable of being removably attached to said front wall around the periphery of said opening, and

a plurality of in-bed tubes having inlet and outlet portions positioned in said fluidized bed, said in-bed tubes being connected at said inlet portions to said inlet feed fluid manifold and at said outlet portions to said outlet steam manifold and extending through and sealably mounted to said cover member at said inlet and outlet portions; and

said boiler including a rear wall opposed to said front wall and opposed side walls and further including a plurality of front, rear and side wall tubes positioned in said combustion chamber at said front, rear and side walls, respectively; said front wall/water wall tubes bending inwardly into said combustion chamber to said rear wall at said opening at said front wall forming a water wall tube pocket at said fluidized bed, and said in-bed tubes being positioned in said water wall tube pocket;

whereby said tube means can be quickly assembled and disassembled from said boiler.

4,593,653

DISTRIBUTOR FOR TWO-PHASE MIXTURES, ESPECIALLY WATER-STEAM MIXTURES IN FORCED-CIRCULATION BOILERS

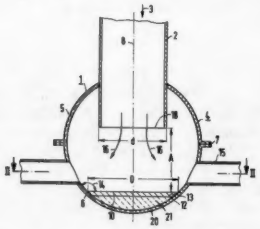
Egon Schneider, Grossenseebach, and Wolfgang Köhler, Kalchreuth, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Continuation of Ser. No. 528,992, Sep. 2, 1983, abandoned, which is a continuation of Ser. No. 309,067, Oct. 6, 1981, abandoned. This application Aug. 31, 1984, Ser. No. 647,255

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040927

Int. Cl.[4] F22B *37/22*

U.S. Cl. 122—365 **8 Claims**



1. Distributor for two-phase mixtures comprising a distribu-

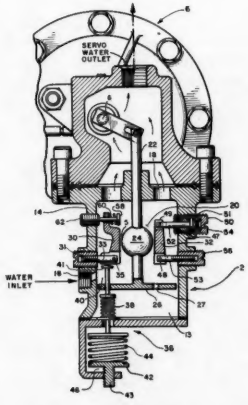
tor drum having an inner surface, a feed tube leading fluid into said distributor drum in a given direction, a plurality of outlet tubes having open ends connected to and leading fluid away from said distributor drum at an angle to the given direction, and a flat baffle plate being disposed in said distributor drum at a given level opposite said feed tube, said baffle plate being fluid impermeable and having a peripheral edge, said baffle plate being connected and sealed to said inner surface of said distributor drum along the entirety of said peripheral edge, and said peripheral edge being connected symmetrically and smoothly to said open ends of said outlet tubes by said inner surface of said distributor drum, said baffle plate continuously guiding fluid above said baffle plate directly into said open ends of said outlet tubes for discharging from said distributor drum along said given level.

4,593,654

COMBUSTION AND FEEDWATER CONTROLLER FOR A FLASH BOILER

Michael J. McInerney, Highland Park, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Sep. 28, 1984, Ser. No. 656,093
Int. Cl.[4] F22D *5/26*
U.S. Cl. 122—451.2 **3 Claims**



1. A controller for compensating feedwater flow through coils of a flash type steam generator comprising;

a housing having a feedwater inlet and outlet;

means supplying feedwater to said inlet at a steam pressure-proportional flow rate;

an essentially cylindrical feedwater flow sleeve for containing said feedwater internal said housing and intermediate said inlet and outlet;

a flow responsive control member having an essentially spherical portion concentrically mounted internal said sleeve, said control member and sleeve defining a feedwater flow control orifice;

means mounting said control member for vertical reciprocating movement relative said sleeve thereby establishing flow related positions of said member;

slots in said sleeve adjacent said spherical member defining bypass flow channels, said flow channels intermediate the spherical portion periphery and said slots;

control gates in said slots for containing flow through said channels;

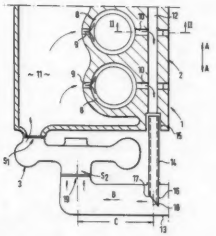
means moving said gates in said channels providing adjustment in control member position for varying feedwater flow through said flow control orifice.

4,593,655

VALVE SEAT RING COOLING APPARATUS

Hans Mezger, Freiberg, Fed. Rep. of Germany, assignor to Dr. Ing. H.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 717,020
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412052
Int. Cl.[4] F01P *3/14*
U.S. Cl. 123—41.77 **7 Claims**



1. An arrangement for cooling valve seat rings provided in a cylinder head of an internal-combustion engine having an engine cooling system, said valve seat rings being surrounded by annular ducts through which a liquid cooling medium can be circulated, a pump for circulating the liquid cooling medium, feeding and discharge lines that are connected to the annular ducts, the improvement comprising:

said pump being connected to supply said cooling medium to both said annular ducts and said engine cooling system,

a first guiding duct connected between an output side of the pump and the feeding lines, and

a second guiding duct connected to the discharge lines,

a first pipe section connected between said second guiding duct and an inlet branch of an intake side of said pump, said pipe section having an angled portion which projects into said inlet branch, said inlet branch also connecting said engine cooling system to said intake side of the pump,

wherein said arrangement provides a forced circulation of the cooling medium through the annular ducts of the valve ring seats in parallel to said engine cooling system with respect to said pump.

4,593,656

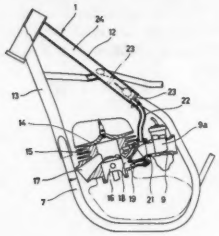
INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hirotaka Shibata, Hamamatsu, and Takayoshi Muramatsu, Fukuroi, both of Japan, assignors to Yamaha Hatsukoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 246,064, Mar. 20, 1981, abandoned. This application Jun. 28, 1985, Ser. No. 750,234
Claims priority, application Japan, Mar. 20, 1980, 55-35489
Int. Cl.[4] F02B *27/00*
U.S. Cl. 123—52 M **5 Claims**

1. In an induction system for a motor vehicle having a chassis and an engine supported thereby, said engine having a chamber of variable volume, an intake passage for supplying a charge to the chamber, and a throttle valve for controlling the flow through said intake passage, the improvement comprising a closed volume plenum chamber, conduit means interconnecting said plenum chamber directly and only with said intake passage downstream of said throttle valve, the volume of said plenum chamber and the effective cross-sectional area and length of said conduit means being proportional to induce a continuing flow of the charge through said intake passage and into said plenum chamber when said variable volume chamber is not inducting a charge through said intake passage for subsequent discharge of the charge from the plenum chamber along with a succeeding charge flowing from said intake passage

upstream of said plenum chamber into the variable volume chamber when said variable volume chamber again inducts a charge, and means supporting said plenum chamber from said chassis independent of said engine and of said conduit means.

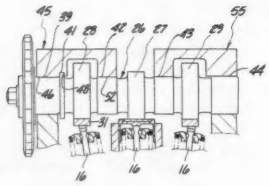


4,593,657

CAMSHAFT BEARING ARRANGEMENT

Kazuo Aoi, and Toshikazu Ozawa, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Jun. 11, 1985, Ser. No. 743,600
Claims priority, application Japan, Jun. 12, 1984, 59-119184
Int. Cl.[4] F01L *1/04*
U.S. Cl. 123—90.6 **10 Claims**



1. A bearing arrangement for the camshaft of an internal combustion engine or the like which camshaft is formed along its length in axial order with a first bearing surface, a first cam lobe, a second bearing surface, a second cam lobe, a third bearing surface, a third cam lobe and a fourth bearing surface, the improvement comprising first bearing means extending around substantially the full circumference of said first bearing surface and journaling said first bearing surface, second bearing means extending around substantially less than the circumference of said second bearing surface and journaling said second bearing surface, third bearing means extending around substantially less than the circumference of said third bearing surface and journaling said third bearing surface, and fourth bearing means extending around substantially the full circumference of said fourth bearing surface and journalling said first bearing surface.

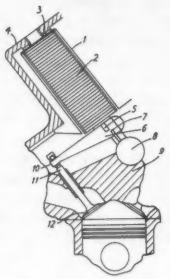
4,593,658

VALVE OPERATING MECHANISM FOR INTERNAL COMBUSTION AND LIKE-VALVED ENGINES

Paul J. Moloney, 33 Malvern Drive, Woodford Green, Essex, England

Filed May 1, 1984, Ser. No. 605,922
Int. Cl.[4] F01L *9/04*
U.S. Cl. 123—90.11 **16 Claims**

1. A valve operating mechanism for an internal combustion engine comprising a piezo-electric actuating device arranged to drive an engine valve opening directly into a combustion chamber by the expansion of said piezo-electric actuating device such that expansion of said piezo-electric actuating device provides the sole motive force for opening said valve and control means to control an electrical feed to said piezo-electric actuating device in accordance with parameters of engine operation fed to it.

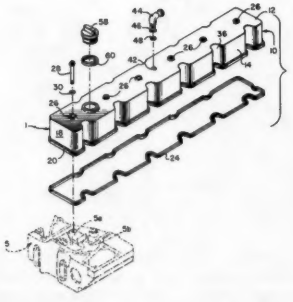


4,593,659

ENGINE VALVE COVER

Larry Wells, and Karl Graham, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 28, 1985, Ser. No. 749,744
Int. Cl.[4] F01M *9/10*
U.S. Cl. 123—90.38 **20 Claims**



1. A valve cover for an internal combustion engine, comprising:

a cover body of an inverted trough-like configuration having a top wall, opposed elongated side walls and opposed end walls, a perimetric flange surrounding an open bottom side of said inverted trough-like configuration, and a seal receiving groove formed in a bottom surface of said perimetric flange and extending more than one full circuit around the perimeter of said open side;

an elongated elastomeric seal strip having a length that is greater than the circumference of the cover body as measured within said seal receiving groove, said elongated elastomeric seal strip being inserted within said seal receiving groove in a manner werein opposite ends of the seal strip are overlapped side-by-side and the bottom of said seal strip extends out of said seal receiving groove so as to form a sealing ridge around the bottom of said flange; and

means for mounting the valve cover on a head of an engine.

4,593,660

PISTON DRIVE FOR USE IN DIESEL ENGINES OR THE LIKE

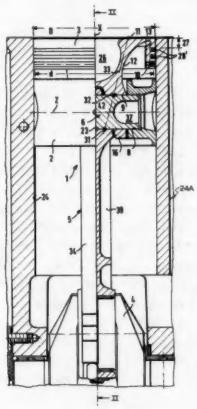
Ludwig Elsbett, and Günter Elsbett, both of Industriestrasse 14, D-8543 Hilpoltstein, Fed. Rep. of Germany

Filed Mar. 24, 1983, Ser. No. 478,284

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210771

Int. Cl.[4] F02F *3/00*

U.S. Cl. 123—193 P 32 Claims



1. A piston drive for use in reciprocating-piston internal combustion engines, such as diesel engines, comprising a cylinder (24A) having a chamber; a piston (2+3) reciprocably installed in said chamber and including a sealing section (3) and a guiding section (2) for the sealing section (3), said sections being spaced apart from one another as considered in the axial direction (X) of the cylinder; a crankshaft (4); a connecting rod (5) coupled with said crankshaft; and a pivot member (6) coupling said connecting rod with said piston and movably connecting said sections to one another, said connecting rod having a central portion (39) between said pivot member and said crankshaft and said sealing section comprising a crown (11) which is remote from said pivot member, a forked base portion (14) adjacent to said pivot member and an annular supporting portion (12) coaxial with said cylinder and connecting said crown with said base portion, said supporting portion having relatively thick end portions respectively integral with said crown and said base portion and a thinner neck portion between said end portions, said forked base portion having first and second arms (16) which diverge from said supporting portion and said sealing section further including a carrier portion (10) integral with said supporting portion and adjacent to the cylinder, said carrier portion having an external surface surrounded by the cylinder and at least one sealing ring recessed into said external surface, said crown and said carrier portion defining an annular recess (13), said arms and said connecting rod having internal surfaces (18, 19 and 23) surrounding said pivot member, the internal surface of said connecting rod being divided by a first plane which includes the axis (X) of said cylinder and is normal to the axis (Z) of said pivot member into first and second surface portions of equal length and each such surface portion having a center (31) disposed midway along the respective surface portion, the internal surfaces of said arms having centers (32) each disposed midway along the internal surface of the respective arm, said centers (31 and 32) being disposed in a second plane including the axes (X and Z) of said cylinder and said pivot member, a first straight line (33) connecting the centers of the internal surface of said first arm and said first surface portion and a second straight line (33) connecting the centers of the internal surface of said second arm and said second surface portion being mirror symmetrical to each other with reference to said first plane, each of said straight lines extending from the central portion of said connecting rod, through said base portion, through said supporting portion and to said crown and being an uninterrupted line which is not intersected by the contours of said sections, at least in the region between said base portion and said crown, each of said straight lines extending substantially midway across the neck portion of said supporting portion.

4,593,661

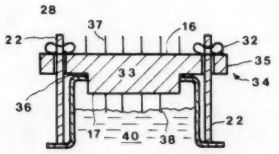
HEAT SINK FOR AN INTERNAL COMBUSTION ENGINE

S. L. Brander, 1456 E. Phila., Space 329, Ontario, Calif. 91761

Filed Sep. 26, 1985, Ser. No. 780,698

Int. Cl.[4] F01M *1/00*

U.S. Cl. 123—196 AB 9 Claims



1. A heat dissipating device adapted to be mounted atop an internal combustion engine having upright threaded posts adapted to accommodate a valve cover panel, said device comprising:

a) an aluminum plate of integral monolithic construction having an upper surface of generally elongated subsantially rectangular periphery, a bottom surface whose outer periphery is inwardly displaced from the periphery of the upper surface, and a boundary edge intervening between said surfaces and comprised of a shoulder disposed above and extending outwardly from said bottom surface, a sidewall perpendicularly disposed between said shoulder and bottom surface and defining the periphery of said bottom surface, and at least four channels extending normally through said shoulder at sites adjacent the opposed extremities of the plate,

b) continuous resilient sealing means associated with the underside of said shoulder, and

c) a valve cover panel having an upper surface having an aperture therein which closely conforms to the periphery of the bottom surface of said plate, permitting insertive engagement of said bottom surface and sealing engagement with said shoulder.

4,593,662

VALVE CONTROL OF A SUPERCHARGED FOUR-CYCLE INTERNAL COMBUSTION ENGINE

Rolf Baring, Immenstaad; Wolfgang Rudert, Langenargen, and Gerd-Michael Wolters, Markdorf, all of Fed. Rep. of Germany, assignors to MTU Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,443

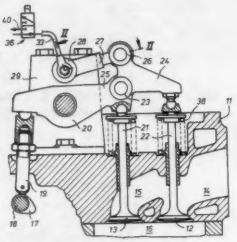
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1984, 3438556

Int. Cl.[4] F02B *77/00*

U.S. Cl. 123—198 F 13 Claims

1. A valve control for a supercharged four-cycle internal combustion engine in which each cylinder head includes two inlet valves operable to control an inlet channel system that imparts during the suction stroke a rotary movement about the cylinder longitudinal axis to the air flowing into the combustion space, valve-actuating means common to both inlet valves including a cam shaft, a cam on the cam shaft and adjusting

means for the valve clearance compensation of the inlet valves, the adjusting means for at least one of the inlet valves per cylinder head having a piston-cylinder-unit fed with pressure oil, a pressure oil feed line for said last-mentioned adjusting means, controllable closure means arranged in said pressure oil feed line, and the piston and cylinder of the last-mentioned adjusting means exhibiting relative displaceability in case of a pressureless cylinder space which, matched to the kinematics of the valve-actuating means, precludes opening of the inlet



valve coordinated to said last-mentioned adjusting means said valve-actuating means further includes a rocker lever means having a rocker lever arm, a two-armed lever operatively connected with the rocker lever means and the end of the valve stem of the at least one inlet valve, rectilinear guide means including said rocker lever arm and link means having a stem, said two-armed lever cooperating with said rectilinear guide means, and the piston and cylinder of the adjusting means forming the stem of said link means.

4,593,663

CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE HAVING A CARBURETOR

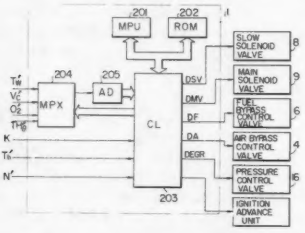
Takeshi Atago; Yasunori Mouri; Tokuo Kosuge, all of Katsuta; Toshio Furuhashi, Ibaraki; Osamu Abe, Katsuta, and Taiji Hasegawa, Nakaminato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 8, 1980, Ser. No. 110,469

Claims priority, application Japan, Jan. 16, 1979, 54-2195

Int. Cl.[4] F02M *9/10*

U.S. Cl. 123—440 **20 Claims**



1. A method of operating a processor-controlled apparatus for controlling the operating of an internal combustion engine having a carburetor through which the air fuel ratio of the air-fuel mixture supplied to the engine is controlled, said carburetor having a low speed fuel system including a slow fuel passage containing a slow jet and a slow solenoid-operated valve coupled with said slow fuel passage for controlling fuel supplied therethrough to said slow jet, and a high-medium speed fuel system including a main fuel passage containing a main fuel jet and a main solenoid-operated valve coupled with said main fuel passage for controlling fuel supplied therethrough to said main jet, additional air-fuel supply control means for controlling the supply of an air-fuel mixture to the engine while bypassing the carburetor, said additional air-fuel supply control means including additional fuel supply control means and additional air supply control means, said additional fuel supply control means further comprises a fuel bypass control solenoid-operated valve:

(a) storing, in memory, predetermined data, as a three dimensional map of values defining prescribed operation adjustment settings of said slow and main solenoid-operated valves corresponding to the difference between air-fuel characteristics of said carburetor for desired engine operation and air-fuel characteristics perculiar to said carburetor in accordance with values of negative intake pressure and speed of rotation of a crankshaft of the engine;

(b) in response to sensed values of negative intake pressure and speed of rotation of the engine crankshaft, generating control signals in accordance with the data stored in step (a) and accessed from memory in accordance with said sensed values of negative intake pressure and speed of rotation of the engine crankshaft;

(c) operating said slow and amin solenoid-operated valves in accordance with the control signals generated in step (b), thereby controlling said air-fuel ratio based upon predetermined data previously stored in step (a) and accessed from memory in accordance with sensed values of negative intake pressure and speed of rotation of the engine crankshaft, and wherein, in response to a sensed value of a prescribed characteristic of exhaust gases from said engine, step (b) further includes generating said control signals for controlling the rate of opening of each of said slow and main solenoid-operated valves such that when said sensed value of a characteristic of exhaust gas is representative of an air/fuel value richer than a predetermined value, a pregiven value is added to predetermined data accessed from memory so as to cause a decrease in the amount of fuel supplied to the engine, and when said sensed value of a prescribed characteristic of exhaust gases is representative of an air/fuel value leaner than a predetermined value, a pregiven value is substracted from predetermined data accessed from memory, so as to cause an increase in the amount of fuel supplied to the engine;

(d) in response to said engine operating in a non-steady state mode, controlling the operation of said additional air-fuel supply control means on the basis of selected sensed engine operating parameters, comprising the step of controlling the operation of at least one of said additional fuel supply control means and said additional air supply control means including:

(d1) in response to an acceleration condition of said engine, generating first data representative of a prescribed rate of opening of said fuel bypass control solenoid-operated valve in accordance with a prescribed rate of change of engine intake vacuum,

(d2) generating second data representative of a coefficient associated with the control of the amount of air supplied by said additional air supply control means in accordance with sensed engine temperature,

(d3) modifying said first data in accordance with said second data to obtain third data representative of the duty ratio of an output signal for operating said fuel bypass control solenoid-operated valve,

(d4) generating said output signal for operating said fuel bypass control solenoid-operated valve in accordance with said third data, and

(d5) applying said output signal to said fuel bypass control solenoid-operated valve.

5. An apparatus for controlling an internal combustion engine of a carburetor type including at least an intake pipe, an exhaust pipe, an low speed fuel system having a slow fuel passage containing a slow jet and a high-medium speed fuel system having a main fuel passage containing a main fuel jet, said control apparatus comprising a plurality of sensor means

for sensing a plurality of variables of engine operating conditions and generating a plurality of output signals indicative of the sensed variables, respectively, and including an intake vacuum sensor for sensing the vacuum in the intake pipe and a rotation sensor for sensing the crankshaft rotation speed of the engine, a slow solenoid-operated valve coupled with said slow fuel passage for controlling fuel supplied therethrough to said slow jet and a main solenoid-operated valve coupled with said main fuel passage for controlling fuel supplied therethrough to said main jet, and at least one electronic memory means for storing predetermined data, related to the variables of the engine operation condition, has a three dimensional map of correction values of the rate of opening of said slow solenoid-operated valve and said main solenoid-operated valve relative to intake vacuum and crankshaft rotation speed of the engine, said correction values being representative of the difference between air-fuel ratio characteristics of a carburetor for desired engine operation and an air-fuel ratio characteristic peculiar to said carburetor, the rate of opening of each of said slow solenoid-operated valve and said main solenoid-operated valve being controlled on the basis of said predetermined map data corresponding to sensed values of intake vacuum and engine crankshaft rotation speed, so as to control the air-fuel ratio of the air-fuel mixture supplied to said engine by way of said carburetor according to said intake vacuum and engine crankshaft rotation speed, and wherein said sensor means further includes a gas sensor for providing an output signal indicative of a prescribed characteristic of exhaust gas in said exhaust pipe, and wherein the rate of opening of each of said slow solenoid-operated valve and said main solenoid-operated valve are controlled such that when the output signal from said gas sensor is representative of an air/fuel value richer than a predetermined value, a pregiven value is added to a correction data value obtained from said map so as to decrease the fuel supplied to the engine, and when the output signal from said gas sensor is representative of an air/fuel value leaner than said predetermined value, a pregiven value is subtracted from a correction data value obtained from said map so as to increase the fuel supplied to the engine, additional fuel supplying means for supplying fuel to the engine while bypassing the carburetor, additional air supplying means for supplying air to be mixed with fuel supplied by said additional fuel supplying means, fuel regulating means for regulating the amount of fuel supplied by said additional fuel supplying means, air regulating means for regulating the amount of air supplied by said additional air supplying means, whereby the air-fuel ratio of said air-fuel mixture supplied to the engine by way of said low speed fuel system or said high-medium speed fuel system is controlled to meet the engine operating condition, a first signal generating means for generating a first control signal in response to the output signals from said sensor means for controlling said air regulating means and second signal generating means for generating a second control signal in response to said output signals from said sensor means and said output signal from said first signal generating means for controlling said fuel regulating means, said sensor means further include a temperature sensor sensing the temperature of the engine and a throttle switch sensing the fully closed position of the throttle valve, said air regulating means includes a solenoid-operated valve whose rate of opening is controlled by said first control signal generated from said first signal generating means, and said fuel regulating means includes a solenoid-operated valve whose rate of opening is controlled by said second control signal generated from said second signal generating means.

4,593,664

FUEL INJECTION APPARATUS

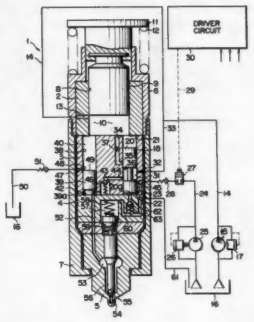
Toshihiko Omori, Nagoya, Japan; Shuzi Sakakibara, Rancho Palos Verdes, Calif.; Masaaki Kato, Kariya, and Akira Masuda, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 28, 1985, Ser. No. 770,092

Claims priority, application Japan, Sep. 4, 1984, 59-184919; Oct. 8, 1984, 59-212275

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—446 **15 Claims**



1. A fuel injection apparatus for supplying fuel from a fuel tank to at least one combustion chamber of an internal combustion engine, comprising:

an injector housing defining therein a pressure cylinder bore, an injection cylinder bore and a timing cylinder bore connected in series with the pressure cylinder bore;

a pressure plunger, fitted in the pressure cylinder bore and having one end defining, in the pressure cylinder bore, a pressure pump chamber communicating with the injection cylinder bore and the timing cylinder bore;

first fuel supply means for supplying fuel from said fuel tank to said pressure pump chamber;

pressurizing means for reciprocating said pressure plunger in the pressure cylinder bore in synchronism with the engine operation so as to pressurize fuel in said pressure pump chamber;

an injection plunger, having a diameter smaller than said pressure plunger, fitted in the injection cylinder bore and having two ends defining, in the injection cylinder bore, an injection pump chamber and a first communicating chamber communicating with said pressure pump chamber;

second fuel supply means for adjusting the quantity of the fuel from said fuel tank in accordance with engine operation conditions so as to supply the adjusted fuel quantity to said injection pump chamber;

injection valve means for injecting the fuel into said fuel pump chamber toward a combustion chamber of the engine when the pressure in said pressure pump chamber is applied to said injection plunger through said first communicating chamber, and the fuel pressure in said injection pump chamber reaches a predetermined injection pressure;

a timing plunger fitted in the timing cylinder bore and having two ends defining, in the timing cylinder bore, a timing chamber and a second communicating chamber communicating with said pressure pump chamber;

third fuel supply means for adjusting the quantity of fuel from said fuel tank in accordance with the engine operation conditions so as to supply the adjusted fuel quantity to said timing chamber; and

relief means for relieving the fuel in said timing chamber, said relief means having a relief path coupled to said timing chamber and a relief valve, disposed in said relief path, for opening said relief path when the pressure in said pressure

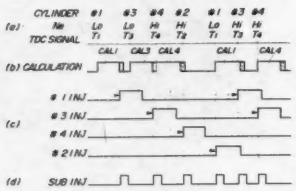
pump chamber is applied to said timing plunger through said second communicating chamber, and a fuel pressure in said timing chamber reaches a predetermined relief pressure by said timing plunger, the relief pressure being set lower than the injection pressure.

4,593,665

FUEL SUPPLY CONTROL METHOD FOR MULTICYLINDER INTERNAL COMBUSTION ENGINES

Noriyuki Kishi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1985, Ser. No. 698,638
Claims priority, application Japan, Feb. 9, 1984, 59-22267
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—478 **8 Claims**



1. A fuel supply control method for an internal combustion engine having a plurality of cylinders, including calculating the quantity of fuel to be supplied to said engine in response to operating conditions of said engine, and sequentially supplying quantities of fuel corresponding to the resulting calculated values into respective corresponding ones of said cylinders, the method comprising the steps of: (a) generating pulses of a timing signal equal in number to the number of said cylinders at predetermined crank angles of said engine per one cycle of said engine; (b) detecting the rotational speed of said engine; (c) calculating the quantity of fuel to be supplied to said engine, in synchronism with generation of said timing signal; (d) determining whether or not the detected engine rotational speed is higher than a predetermined value; (e) starting the supply of fuel to said engine immediately upon completion of the calculation of the fuel quantity in step (c), when the detected engine rotational speed is determined to be lower than said predetermined value; and (f) starting the supply of fuel to said engine immediately upon generation of a first pulse of said timing signal generated immediately after completion of the calculation of the fuel quantity, when the detected engine rotational speed is determined to be higher than said predetermined value.

4,593,666

ADAPTIVE PROCESS FOR CONTROLLING FUEL INJECTION IN AN ENGINE

Rémi Lefevre, Colombes, and Jean-Pierre Lagrue, Palaiseau, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jul. 22, 1985, Ser. No. 757,665
Claims priority, application France, Jul. 23, 1984, 84 11668
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—480 **4 Claims**

1. An adaptive process for continuously determining the injection time of an engine as a function of intake pressure or air flow at the intake comprising the steps of:

establishing a straight control line function defined by a slope and a beginning ordinate;

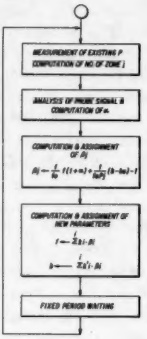
analyzing periodically the exhaust gas of said engine to determine richness differences in said exhaust gases;

dividing the range of possible intake pressures into a number of zones, each of which has assigned a central pressure value at a point in each zone;

measuring the intake pressure and determining the zone into which it falls;

determining in relation to said straight line function a first correction factor as a function of said analyzing and the desired richness;

computing in relation to said straight line function a second correction factor for each zone by a purely linear computation as a function of said first correction factor, said slope and said beginning ordinate;


MEASUREMENT OF EXISTING P
COMPUTATION OF NO. OF ZONE i
ANALYSIS OF PROBE SIGNAL & COMPUTATION OF n
COMPUTATION & ASSIGNMENT OF Ai
COMPUTATION & ASSIGNMENT OF NEW PARAMETERS
FIXED PERIOD WAITING

computing new values of the slope and beginning ordinate by a purely linear formula as a function of constants in read only memory and the values of said second correction factor;

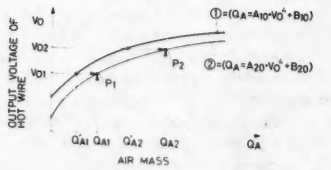
weighting the coefficients used for computing the slope and beginning ordinate during each analysis cycle so that the straight line function approaches the various said points in each zone.

4,593,667

ENGINE CONTROL DEVICE

Shoji Sasaki, Sawa-ryo, 467, Tabiko; Yasunori Mori, 2-18-9, Hashikabe, both of Katsuta-shi, Ibaraki-ken, and Noboru Sugiura, 1360-27, Kasahara-cyo, Mito-shi, Ibaraki-ken, all of Japan

Filed Mar. 19, 1985, Ser. No. 713,534
Claims priority, application Japan, Mar. 19, 1984, 59-51010
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—488 **9 Claims**



1. An engine control device having a sensor for measuring flow rate of the suction air, a sensor for measuring an output air-fuel ratio, and adapted to determine a basic fuel feed rate on the basis of said flow rate of the suction air, and correct said basic fuel feed rate on the basis of said output air-fuel ratio, whereby a fuel feed rate is finally determined, comprising a means (S19) for calculating an actual flow rate of the suction air on the basis of said finally-determined fuel feed rate, a means (S20) for calculating on the basis of said actual flow rate of the suction air a coefficient which is required to correct the properties of said sensor (20) for measuring a flow rate of the suction air, a means (S7) for correcting said flow rate of the

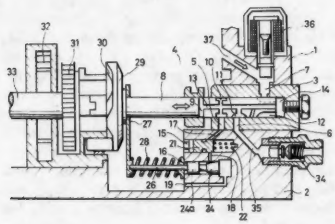
suction air on the basis of said coefficient before taking the data (Vo) on the flow rate of the suction air from said sensor (20) for measuring a flow rate of the suction air, and a means (S8) for determining a fuel feed rate (Ti) on the basis of a corrected flow rate (Q_A) of the suction air.

4,593,668

INJECTION RATE CONTROLLER FOR FUEL INJECTION PUMP

Yasutaka Yuzawa, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1985, Ser. No. 779,094
Claims priority, application Japan, Sep. 23, 1984, 59-199310
Int. Cl.[4] F02M *59/20*
U.S. Cl. 123—496 **6 Claims**



1. An injection rate controller for a fuel injection pump comprising a pump housing, a hollow plunger barrel having a high pressure chamber, a plunger being reciprocative and rotatable within the hollow portion of the plunger barrel and having a cut-off port formed therein so as to communicate with the high pressure chamber, a control sleeve slidably attached to the plunger so as to open and close the cut-off port, and a pump house filled with a fuel oil, which injection rate controller comprises:

a first valve port formed in the pump housing so as to open to the pump house;

a communication aperture formed in the pump housing and adapted to connect said first valve port to the high pressure chamber;

a spool valve slidably accommodated within said first valve port so as to be displaceable in response to the pressure of fuel oil within the pump house and adapted to connect said first valve port to the high pressure chamber through said communication aperture only under a specific condition of engine drive, thereby introducing part of high pressure fuel within the high pressure chamber into said first valve port;

a second valve port formed in the pump housing so as to open to the pump house;

a connection aperture formed in the pump housing for connecting said second valve port to said first valve port;

a pressure control valve having its cross section contracted in its axial direction, accommodated within said second valve port so as to reciprocate in synchronism with the reciprocation of the plunger for opening and closing said second valve port; and

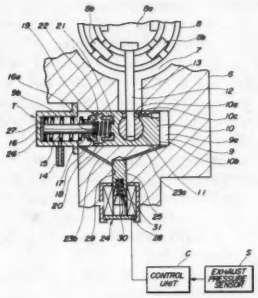
a spill channel formed in the pump housing so as to connect said second valve port to the pump house for allowing high pressure fuel introduced from said first valve port to said second valve port through said connection aperture flow therethrough into the pump house only under said specific condition of engine drive, the amount of the high pressure fuel flowing from said second valve port into the pump house through said spill channel being variable by the amount of displacement of said pressure control valve.

4,593,669

INJECTION TIMING CONTROL DEVICE FOR DISTRIBUTOR-TYPE FUEL INJECTION PUMPS

Shinichi Igarashi, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 2, 1985, Ser. No. 729,693
Claims priority, application Japan, May 8, 1984, 59-91589
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—502 **1 Claim**



1. An injection timing control device for combination with a fuel injection pump for an internal combustion engine having an exhaust passage, filter means arranged in said exhaust passage for trapping fine particles contained in exhaust gases from said engine, and a sensor for detecting exhaust pressure of said engine at a zone upstream of said filter means, said device comprising:

a housing having a cylinder;

a timer piston slidably received within said cylinder;

connecting means for translating displacement of said timer piston into a corresponding change in the fuel injection timing of said fuel injection pump;

said housing defining a hydraulic pressure chamber between said cylinder and one end face of said timer piston, and means for communicating to said hydraulic chamber a hydraulic pressure variable as a function of the rotational speed of said engine to urge said timer piston in a direction of advancing the fuel injection timing;

said housing defining a spring chamber between said cylinder and an opposite end face of said timer piston, and means for communicating said spring chamber with a relatively low pressure zone;

a first spring accommodated within said spring chamber for urging said timer piston in a direction of retarding the fuel injection timing to a most retarded normal operating position, against the pressure in said hydraulic pressure chamber;

a second spring accommodated within said spring chamber and urging said timer piston in said injection timing retarding direction against the pressure in said hydraulic pressure chamber, said second spring having a force smaller than that of said first spring;

spring selecting means for selectively allowing said first and said second springs to operate, in a manner such that while said timer piston is displaced from an initial position thereof to a predetermined position in said injection timing advancing direction, said second spring alone exerts a force thereof to counteract the displacement of said timer piston, and when said timer piston is further displaced beyond said predetermined position in said injection timing advancing direction, at least said first spring exerts a force thereof to counteract the displacement of said timer piston;

said housing defining a communication passage communicating said hydraulic pressure chamber with said spring chamber;

an electromagnetic valve having a solenoid and a spool valve body arranged within said communication passage, said electromagnetic valve having said solenoid selectively deenergized or energized to assume a first position where said valve body closes said communication passage to disconnect said hydraulic pressure chamber from said spring chamber, or a second position where said valve body opens said communication passage to communicate said hydraulic pressure chamber with said spring chamber; and

control means for energizing and deenergizing said solenoid of said electromagnetic valve, said control means being adapted to cause said electromagnetic valve to assume said first position when the exhaust pressure value detected by said sensor is smaller than a predetermined value, and to assume said second position when the detected exhaust pressure value is larger than said predetermined value;

wherein said spring selecting means comprises

a rod accommodated within said spring chamber, said rod having one fixed end remote from said timer piston and another end close to said timer piston,

a spring seat member slidably fitted on said rod at said another end thereof, and

stopper means provided on said rod at said another end thereof for limiting an extreme position of said spring seat member toward said timer piston,

said first spring being interposed between said spring seat member and an opposed end face of said cylinder, said second spring being interposed between said opposite end face of said timer piston and said stopper,

wherein the smaller force of said second spring is such that during normal operation of said engine, said second spring is compressed by said timer piston as displaced by pressure in said hydraulic pressure chamber so that said timer piston contacts said spring seat member, when said electromagnetic valve is at said first position; and

said second spring expands to displace said timer piston away from said spring seat member to a more retarded position than said most retarded normal operating position assumable during normal engine operation, when said electromagnetic valve is at said second position.

4,593,670

FUEL EVAPORATOR FOR INTERNAL COMBUSTION ENGINE

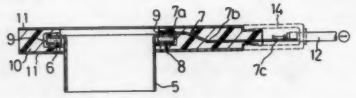
Akio Nara, Okazaki; Akio Yazawa, Obu, and Yoshinori Akiyama, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 15, 1984, Ser. No. 671,614

Claims priority, application Japan, Nov. 20, 1983, 58-179040[U]

Int. Cl.[4] F02M *31/00*

U.S. Cl. 123—545 **5 Claims**



1. A fuel evaporator disposed in an air-fuel mixture passage of an internal combustion engine for promoting the evaporation of fuel within an air-fuel mixture, comprising:

(1) a ring-shaped heater element made of PTC ceramic;

(2) a pipe through which the air-fuel mixture passes; said pipe being made of heat conductive metal and being disposed within said air-fuel passage therealong; said pipe comprising a flange projecting outwardly from an upper end thereof;

said heater element being disposed under and closely in contact with said flange of said pipe;

(3) a pair of terminal members for supplying power to said heater element, which is composed of a first terminal member and a second terminal member, said first terminal member comprising a ring portion disposed above said heater element so as to be closely in contact therewith, and a lead portion of which one end is connected to said ring portion and the other end extends outwardly in the radial direction and is connected to a power supply line; said second terminal member comprising a ring portion disposed under said heater element so as to be closely in contact therewith, and a lead portion arranged along said lead portion of said first terminal member, one end of said lead portion of said second terminal member being connected to said ring portion thereof while the other end of said lead portion of said second terminal member being connected to another power supply line;

said flange of said pipe comprising said ring portion of said first terminal member;

(4) an electricity insulating casing for accommodating and closely sandwiching said flange of said pipe, said heater element and said ring portion of said second terminal member, said casing being composed of a ring-shaped bottom plate having an inner hole and a lid member having an opening of a shape corresponding to said inner hole of said bottom plate; and

(5) a compact made of electrically insulating rubber or synthetic resin and formed into a plate shape around said casing by moulding so that said casing is embedded within said compact.

4,593,671

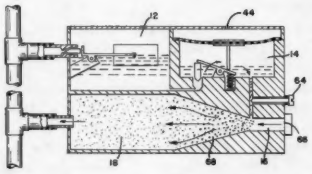
SUPPLEMENTAL CARBURETION DEVICE

Richard K. Boone, 3811 Elldedge Dr., Shawnee Mission, Kans. 66201

Filed Feb. 22, 1985, Ser. No. 704,581

Int. Cl.[4] F02B *25/06*

U.S. Cl. 123—572 **15 Claims**



1. An apparatus for carburetion of an internal combustion engine operating at idle and low engine speeds, the apparatus being in gaseous communication with a crankcase ventilation conduit of the engine comprising in combination:

a fuel reservoir chamber, the reservoir chamber being in fluid communication with a liquid fuel source;

a fuel metering chamber, the metering chamber being in determinate fluid communication with the reservoir chamber, the metering chamber being vented to ambient air pressure;

gas pressure responsive valve means for the determinate fluid communication of the metering chamber with the reservoir chamber, the valve means controlling the volume of liquid fuel in the metering chamber;

a nebulizing chamber, the nebulizing chamber being in fluid communication with the metering chamber and with a gas source; and,

an expansion chamber, the expansion chamber at one end joined to the nebulizing chamber and at an other end in gaseous communication with a portion of the crankcase ventilation conduit;

whereby vacuum from the conduit lowers gas pressure in

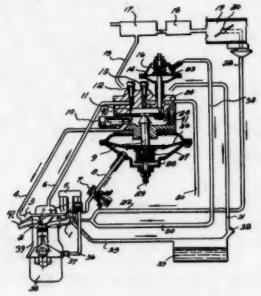
the expansion chamber, nebulizing chamber and metering chamber, the lower gas pressure causing the valve means to admit fuel into the metering chamber from the reservoir chamber, the fuel in the metering chamber being drawn into the nebulizing chamber and nebulized by interaction with gas from the gas source, the nebulized fuel expanding to a vapor within the expansion chamber, the resulting fuel-gas mixture being exhausted into the conduit as a primary source of fuel-gas mixture for idling and low engine speeds.

4,593,672

FUEL ECONOMY APPARATUS

Tomas Barone, Julian Navarro 2838, 1643 Beccar, Argentina

Filed Nov. 9, 1984, Ser. No. 670,330
Claims priority, application Argentina, Nov. 11, 1983, 294786
Int. Cl.[4] F02M *25/06, 25/08*
U.S. Cl. 123—568 **7 Claims**



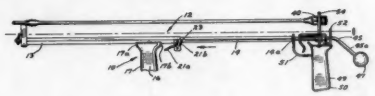
1. An apparatus for treating combustion gases in a motor vehicle having a motor assembly including a crankcase, intake manifold, and suction intake, a fuel tank formed to include an upper part, an exhaust pipe, a regulating device disposed before the intake manifold, and gas return pipe means for coupling each of the fuel tank, crankcase, and exhaust pipe to the regulating device in fluid communication and characterized by said regulating device including a unit providing a chamber divided by a diaphragm into two sub-chambers, of which one is a vacuum sub-chamber connected by means of a connector pipe, to the suction intake of the motor, a thermostat being inserted in the connector pipe, the same sub-chamber having a compression spring lodged against said diaphragm; a stem projecting from the other side of the diaphragm having a stopper head placed in an operative relation in a mixing chamber situated in the unit, the mixing chamber having an opening to the environment, and an intermediate partition; the mixing chamber including additional openings by way of individual regulators to the upper part of the fuel tank, the crankcase of the motor, and the exhaust pipe, respectively; an outlet on the other side of the intermediate partition in the mixing chamber including a regulator for circulating recovered and mixed gas to a pipe connecting with a preheating chamber adjacent at the intake manifold of the motor, the mixing chamber being permanently joined to a gas collector chamber by means of a passage controlled by a regulator; and acceleration valve means for allowing the gas to circulate at a speed required by the motor so that the vacuum-actuated diaphragm, the regulator, and the acceleration valve means cooperate in response to predetermined operating conditions of the motor during a momentary reduction in speed to deliver a continuous flow of recovered and mixed gas to the intake manifold for recombustion resulting in improved fuel economy.

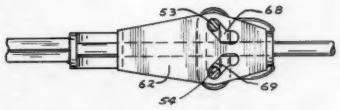
4,593,673

SLING SHOT GUN STRUCTURE

Galen D. Kees, Rte. 2, Box 17B, Durand, Wis. 54736

Filed Apr. 26, 1985, Ser. No. 727,512
Int. Cl.[4] F41B *3/00*
U.S. Cl. 124—20 B **13 Claims**





2. A sling shot device, having in combination
an extensible barrel,
means holding said barrel in extended position,
a forward and rearward handle carried by said barrel,
a rearward extension of said barrel carrying said rearward handle,
a pair of pins upstanding from said rearward handle at either side of said rearward extension,
a plate member overlying said extension,
a trigger depending from said plate member,
a pair of arcuate forwardly diverging slots in said plate member having said upstanding pins extending therethrough,
an elastic divided band member,
means securing said band member at one end thereof in transversely spaced relation to the front end portion of said barrel,
a missile pouch connecting the other ends of said band member,
said pouch being adapted to retain a missile therein and said pins retaining said pouch having a missile therein, and
said trigger moving said plate member to spread said pins and release said pouch loaded with a missile.

4,593,674

COMPOUND ARCHERY BOW

Donald S. Kudlacek, 4312 Oak St., Longview, Wash. 98632

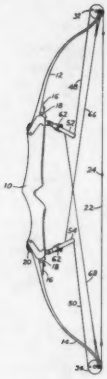
Continuation of Ser. No. 315,704, Oct. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 194,429, Oct. 6, 1980, abandoned. This application Sep. 4, 1984, Ser. No. 647,117
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—23 R **4 Claims**

1. In combination with a compound archery bow wherein a pair of rotary cam members is mounted eccentrically one on the outer end of each bow limb and a bow string extends between the cam members and opposite end segments thereof are secured to the cam members and extending therefrom to attachment to the bow at positions independent of the rotation of the cam members, the pair of rotary cam members each comprising:

(a) a disc having only one circumferential guide grove, the bow string end segment extending outwardly from the associated end of the bow string into contact with the rearward side of the disc groove, thence forwardly around the disc groove for anchoring adjacent the forward side of the disc groove in the rest position of the bow string and thence inwardly out of engagement with the forward side of the disc groove to attachment to the bow at a position independent of the rotation of the other cam member, and

(b) securing means on the disc for releasably securing

thereto a portion of the single wrap of bow string end segment adjacent the forward side of the disc groove in the rest position of the bow string, the bow string end segment extending in opposite directions from the securing means being receivable in the single circumferential guide groove in an unlapped single wrap throughout the range of rotation of the disc between rest and full draw positions of the bow string.



4,593,675

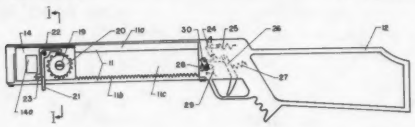
CROSS BOWS

Shimon Waiser, P.O. Box 360, Midwood Station, Brooklyn, N.Y. 11230

Filed Sep. 28, 1983, Ser. No. 536,545

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—25 **11 Claims**



1. In a cross bow comprising a stock, a bow and a bow string, the improvement including:

(a) a movable bow slide to which said bow is attached, said bow slide being attached to said stock in such a manner that it performs reciprocating motion relatively to said stock when said cross bow is being cocked;

(b) slide locking means fixing said slide in different determined positions relatively to said stock;

(c) a projectile holder which is attachable to said bow string, said holder having a recess for containing a projectile;

(d) a releasable catch for holding said bow string and said projectile holder in a cocked position;

(e) trigger means operatively associated with said catch for effecting release of said bow string and said projectile holder therefrom;

(f) said stock having at least one longitudinally extended guideway conforming to the shape of said bow slide for guiding of said bow slide during its movement;

(g) said stock further having longitudinally extended guide surface conforming to the shape of said projectile holder for guiding of said projectile holder during its movement.

4,593,676

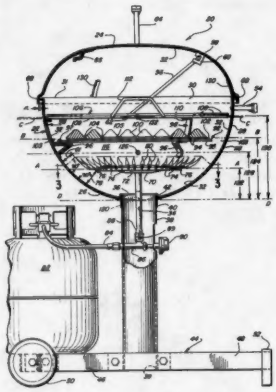
AUTOMATIC CLEANING GAS BARBECUE GRILL

Gunther G. Wackerman, Paris, Ill., assignor to UNR Industries, Inc., Chicago, Ill.

Filed Jan. 20, 1983, Ser. No. 459,350

Int. Cl.[4] A47J *37/00*

U.S. Cl. 126—41 R **46 Claims**



1. A gas barbecue grill which burns at least one type of cooking gas introduced therein from a souce of such fuel and has interior surfaces that are automatically cleaned when heated to a predetermined elevated temperature above the principal cooking temperatures of said gas barbecue grill, which comprises:

(a) a main container having an interior defined by a bottom wall and by side walls, said side walls terminating in an upwardly facing opening, the walls of said main container having interior surfaces that are coated with a coating that includes an oxidizing catalyst, said main container bottom wall having a secondary air inlet opening;

(b) a main container cover for said main container, the interior surface of said cover being coated with a coating that includes an oxidizing catalyst;

(c) a gas burner positioned in said main container, said burner having top, bottom and side walls, and having an outer peripheral portion, said walls of said gas burner defining a plurality of exit ports passing through said walls, said ports being located in said outer peripheral portion of the burner, said burner having a horizontal positioning plane that cuts substantially through the geometric centers of said exit ports, said main container side walls extending downward from said upwardly facing opening of the main container at least to said positioning plane,

said outer peripheral portion of the burner and said main container walls defining between them a passageway for air flow from said secondary air inlet opening upward around said burner, the cross-sectional area of said air flow passageway being at least as large as the cross-sectional area of said secondary air inlet opening in the bottom wall of said main container;

(d) valve means for controlling the gas flow rate from said cooking gas source, said valve means providing:

(i) at least one predetermined rate of flow of a given type of cooking gas for the principal cooking mode of operation of said grill, and

(ii) at least one predetermined higher rate of flow of said given type of cooking gas for an automatic cleaning mode of operation of the grill, in which mode:

the temperature along the interior surfaces of said main container walls and of said cover is maintained, at substantially all points along said surfaces, at a level at least

high enough to cause substantially complete oxidation of small particles of charred foodstuffs, and fats, oils and sauces employed in cooking, that accumulate as waste materials on said interior surfaces during ordinary use,

the temperature of the exterior surfaces said main container walls and of said cover does not rise above an acceptable level, and

the tips of the flame jets that project from said burner exit ports extend to locations adjacent said main container walls without damaging said coating on the interior surfaces of the walls;

(e) means for operatively connecting said cooking gas source and said valve means;

(f) means for mixing cooking gas from said gas source with primary air from outside said barbecue grill;

(g) means extending through said main container bottom wall for introducing said mixture of cooking gas and primary air into said gas burner in the interior of said main container;

(h) a grate to support a plurality of pieces of a refractory material, said pieces of refractory material being formed in a bed with an outer peripheral edge when positioned on said grate, a gap being formed between said outer peripheral edge and the interior surfaces of said side walls, with a plurality of smaller gaps between said pieces of refractory material, said grate having a top surface which is located in a first horizontal plane above said gas burner; and

(i) a cooking grid for supporting foodstuffs above said burner within the grill, said cooking grid having a bottom surface located in a second horizontal plane above said grate,

said horizontal positioning plane of the gas burner, said main container side walls, and said first horizontal plane in which the top surface of said grate is located defining a main combustion chamber,

the volume of said main combustion chamber being approximately 10 percent to 28 percent of the total volume of the interior of said gas barbecue grill when said cover is in place upon said main container,

the center of gravity of the air within the volume defined by said main combustion chamber being at a level that is spaced above the lowest point on the interior surface of said bottom wall of the main container, when said gas barbecue grill is standing upright in position for use in cooking, by a vertical distance approximately 48 percent to 62 percent of the vertical distance between said lowest point on the bottom wall and the level of the center of gravity of the air within the volume defined by said main container and the main container cover when the container cover is in place upon the main container,

said grill having exhaust outlet means, the ratio, for said automatic cleaning mode of operation of said grill, between the total cross-sectional area of said exhaust outlet means and the total volume enclosed by said main container and said main container cover when said cover is in place upon said main container being such as to permit the escape of the exhaust mixture resulting from the combustion of said cooking gas and to avoid the accumulation within the grill of carbon monoxide above safe levels, while limiting the escape of said exhaust mixture from said gas barbecue grill to maintain the necessary waste material combustion temperature along the inner surfaces of said main container walls and of said cover.

4,593,677

RANGE GRATE AND RETAINING CLIP ASSEMBLY

Issac P. Sargunam, Ontario, Calif., assignor to Magic Chef, Cleveland, Tenn.

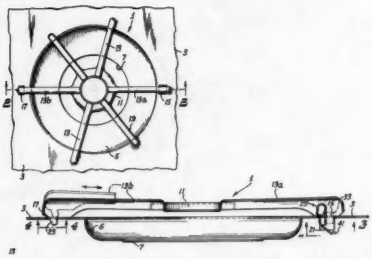
Filed Jul. 29, 1985, Ser. No. 759,841
Int. Cl.[4] F24C *15/06*
U.S. Cl. 126—214 C **7 Claims**

1. An improved range grate and retaining clip assembly for detachably securing the grate over the burner well of a range top, the grate including at least one downwardly extending projection means for insertion through a corresponding opening in the range top, which assembly comprises:

(a) the retaining clip being defined by a U-shaped spring portion including first and second legs urgeable towards each other under spring action;

(b) the first leg including means for attaching the clip to the projection means;

(c) the second leg including means for engaging the range top;



(d) wherein the projection means is defined by a pair of spaced projections and the means for attaching the clip to the projections includes a pair of spaced flanges for embracing the projections; and

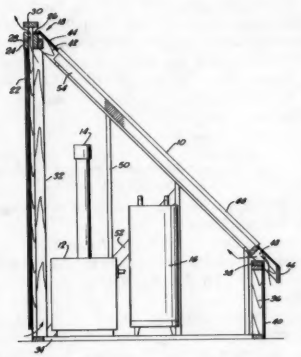
(e) wherein when the projection means and attached clip are inserted through the opening and disposed in an operative position, the grate may be shifted relative to the stove top against the spring action of the legs.

4,593,678

HOT WATER SUPPLY SYSTEM

James R. Piper, 9581 Featherhill Dr., Villa Parke, Calif. 92661

Filed Aug. 3, 1981, Ser. No. 289,402
Int. Cl.[4] F24J *2/42*
U.S. Cl. 126—427 **6 Claims**



1. A hot water supply system comprising

a boiler having an exhaust;

solar panels; and

a frame supporting said solar panels and including a compartment beneath said solar panels, said boiler exhaust termining in said compartment beneath said solar panels, said boiler being within said compartment.

4,593,679

CONNECTOR DEVICE FOR AN ENDOSCOPE

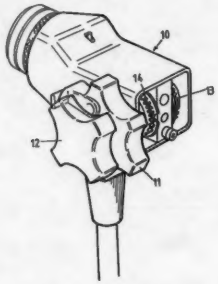
Ian P. Collins, Welwyn, England, assignor to Warner-Lambert Technologies, Inc., Southbridge, Mass.

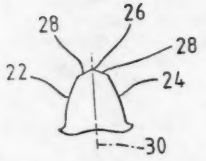
Filed Feb. 4, 1985, Ser. No. 697,807

Claims priority, application United Kingdom, Feb. 9, 1984, 8403431

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **3 Claims**





1. An endoscope having a shaft, a handle separable from the shaft and a mechanism for transmitting motion from the handle to the shaft, the mechanism comprising two rotatable gearwheels which are respectively rotatably mounted in the handle and shaft and which are capable of being taken into and out of engagement by relative movement of the handle and shaft, wherein each gearwheel has teeth each of which has a crown shaped so as to have a central ridge positioned between sloping sides which extend from the ridge to the corresponding face of the tooth, the sloping sides of the crowns facilitating interengagement of the gearwheels when the latter are brought into crown-to-crown engagement in a non-rotating condition, said crown sides being planar, the minimum angle of inclination (to a notional planar crown) being a function of the coefficient of friction of the material of the gearwheels, said minimum angle ranging between 20° and 30°.

4,593,680

ENDOSCOPE

Hiroaki Kubokawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,336

Claims priority, application Japan, Jan. 17, 1984, 59-4710

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **16 Claims**

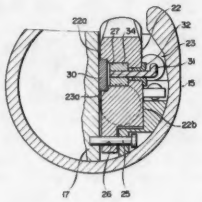
1. An endoscope comprising:

an operation section having an inlet for a treating unit;

a flexible insertion section extending from the operation section, said insertion section having a chamber formed in the extended end thereof and opened externally, and a guide channel extending from the inlet to the chamber through the insertion section;

a guide member, movably arranged in said chamber, for guiding the end portion of the treating unit, introduced into the chamber through the inlet and the guide channel, in a predetermined direction, said chamber having a side wall for guiding the movement of said guide member and said guide member having one side wall opposite to the side wall of the chamber and another side wall opposite to said one side wall;

operation means, having one end coupled to said another side wall of the guide member and extending to the operation section through the insertion section, for operating the guide member from the operation section; and



friction reducing means for reducing the friction between the side walls of the guide member and the chamber, said friction reducing means including a friction reducing layer coated on the side wall of the guide member and being in contact with the side wall of the chamber.

4,593,681

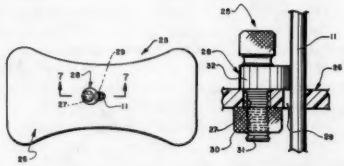
STABILIZING DEVICE FOR USE IN ARTHROSCOPIC AND ENDOSCOPIC SURGERY

Prasanna L. Soni, 4717 Greenbriar Sq. N.E.,, Canton, Ohio 44714

Filed Jan. 18, 1985, Ser. No. 692,429

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **7 Claims**



1. A device for stabilizing a sheath of an endoscope or arthroscope during surgery including a plate formed of a flexible plastic material adapted to be placed against the patient's body at an area where the sheath penetrates the body; a camming stud rotatably mounted on the plate; and a tapered hole formed in the plate adjacent the camming stud for receiving the sheath extending therethrough during surgery with the camming stud being rotatable into engagement with the sheath to retain and hold said sheath within said tapered hole.

4,593,682

ENDOSCOPE

Helmut Heckele, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,705

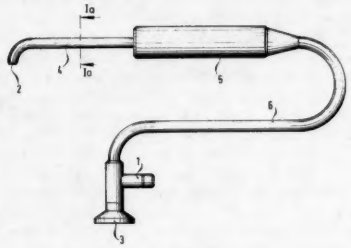
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1983, 8327753[U]

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **9 Claims**

1. In an endoscope having continuous image and light ducts for the observation and examination of body cavities, in particular prefrontal sinuses, the improvements comprising said

endoscope being divided into a first relatively rigid distal longitudinal member forming a unit with a handle and having a distal end and a second relatively flexible longitudinal member proximally joined to the handle of the unit and comprising



an eyepiece joined to the image duct and a connector for the light duct so that as said handle controls movement of the distal end of the unit into a body cavity, the second flexible member allows relative movement between the handle and eyepiece.

4,593,683

MEDICAL EXAMINATION INSTRUMENT WITH HEADBAND SUPPORT

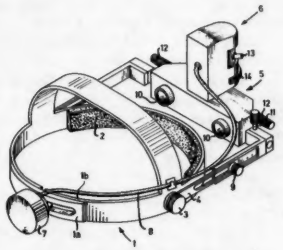
Erich Blaha, Essingen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Nov. 29, 1984, Ser. No. 676,072

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1983, 8334797[U]

Int. Cl.⁴ A61B *1/06*; F21L *15/14*

U.S. Cl. 128—23 **1 Claim**



1. A headband to be worn on the head of a person making an examination, said headband having a rear part including two members overlapping each other and slidable relative to each other to adjust the size of the headband to the size of the head of said person, means for attaching to a forward part of said headband an examination instrument including an electric illuminating unit, and clamping screw means at said rear part of said headband, said clamping screw means including a relatively large head manually engageable to tighten or loosen said clamping screw means, said head forming a case for holding a power supply unit for said illuminating unit, the weight of said head and of a power supply unit contained therein serving as a counterweight on said rear part of said headband to tend to counteract a forward tilting tendency caused by weight of said examination instrument.

4,593,684

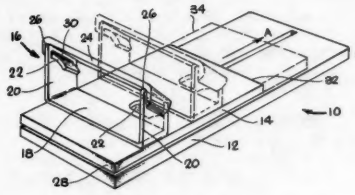
OCCIPITAL SUPPORT FOR CERVICAL TRACTION

Erwin W. Graham, 13565 Wendy La., Saratoga, Calif. 95070

Filed Mar. 1, 1984, Ser. No. 585,361

Int. Cl.⁴ A61H *1/02*

U.S. Cl. 128—75 **15 Claims**



8. An occipital support for a cervical traction device comprising,

a flat, elongated support base adapted to be horizontally disposed and having front and rear portions,

a flat carriage slideably mounted over said base, the carriage having an upper surface with front and rear portions, the carriage being smaller than the base in the base's elongated dimension,

a rigid brace attached to the upper surface of the carriage, said brace having spaced-apart upright arms,

a wide resilient elastomeric occipital support band mounted a small distance above the carriage surface between the arms of said brace in such a way as to define an angle of between 30° and 60° from the upper surface of said carriage, so as to engage by elastomeric flexing the occipital region of the head of a user in a recumbent position relative to the carriage, with a portion of the head extending below said band, and

traction means for applying force to move said carriage from the front to the rear of said base whereby said force is applied through the band against the occipital region of the skull when a user is in a recumbent position relative to the carriage.

4,593,685

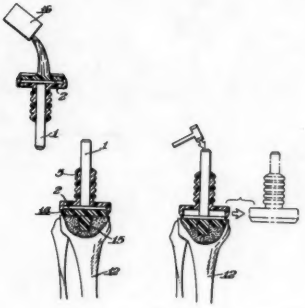
BONE CEMENT APPLICATOR

William F. McKay, Budd Lake, N.J., and Peter S. Walker, Weston, Mass., assignors to Pfizer Hospital Products Group Inc., New York, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,621

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—92 E **9 Claims**



1. A bone cement applicator adapted for the application of a predetermined amount of cement solely to a predetermined surface area of a bone in an arthroplasty procedure to achieve

substantially uniform penetration over said predetermined surface area of the bone, which comprises a cylindrical plunger rod having an exposed proximal end adapted to be struck for dispensing said cement, said rod being perpendicular to and terminating in an integral flat substantially rigid applicator plate, said rod being slidably mounted in a tubular sleeve integral with an open-ended reservoir around the applicator plate, the periphery of said reservoir having a configuration conforming to said bone surface area and the capacity of the reservoir when the plunger is fully retracted conforming to the predetermined amount of cement.

4,593,686

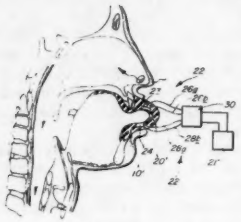
MONITOR FOR AN ANTI-APNEA DEVICE

Stephen R. Lloyd, 5642 N. Bernard, Chicago, Ill. 60659, and Charles F. Samelson, 5712 S. Kenwood, Chicago, Ill. 60637

Filed Nov. 13, 1984, Ser. No. 670,991

Int. Cl.[4] A61F *5/56*

U.S. Cl. 128—136 **16 Claims**



1. In a device for treatment of sleep apnea by preventing the flow of air through a user's mouth while engaging the tip of the user's tongue in a socket, the engagement resulting from creation of suction in the socket, the improvement comprising:

detection means connected to the device for generating an electrical signal when the tongue is disengaged from the socket; and

alarm means operably coupled to said detection means for generating an alarm in response to said electrical signal.

4,593,687

ENDOTRACHEAL CATHETER

Leo C. Gray, Caroga, N.Y.

Filed Oct. 31, 1983, Ser. No. 546,943

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—200.26 **4 Claims**

1. An endotracheal catheter comprising a relatively small diameter flexible tubing member for placement through the tracheal wall of a human; one end of said tubing member adapted to form an elliptically shaped bulbous expandable anchoring lock with the trachea after insertion therein, and the other end of said tubing member having means adapted for connection to a conduit; the one end of said tubing member adapted to form said expandable anchoring lock comprising a plurality of equi-spaced magnetic wires embedded longitudinally within the wall area of said one end of said tubing member and a corresponding number of longitudinal cuts extending through the wall of said tubing member and positioned midway between each of said magnetic wires; said magnetic wires being bowed outwardly and adapted to flex to straight and parallel positions with respect to each other under the influence of a magnetic field created within the interior of said tubing member and to bow outwardly upon removal of said magnetic field whereby said elliptically shaped bulbous anchoring lock is formed within the trachea by the spreading of said flexible tubing member about said wires and wherein said cuts form elliptically shaped apertures through which a fluid can flow.

4,593,688

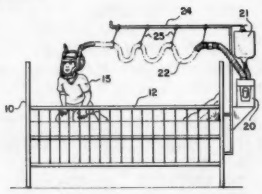
APPARATUS FOR THE DELIVERY OF OXYGEN OR THE LIKE

Hugh W. Payton, 36 S. Main St., Jeffersonville, Ohio 43128

Filed May 30, 1984, Ser. No. 615,195

Int. Cl.[4] A61M *10/00*

U.S. Cl. 128—200.28 **6 Claims**



1. Apparatus adapted to be supported on the head of a patient for controllably supplying gas from a source of gas under low pressure to the mouth and nose region of the patient for breathing by the patient, comprising:

a head piece having lateral side members adapted to extend around the patient's head and transverse members connected to said lateral members and proportioned to extend transversely of the head over the top and along the sides of the head and means for joining said transverse members at the top of the patient's head,

a frontal support frame having a generally U-shaped bottom and a pair of side arms connected to the free ends thereof, respectively, means for connecting said side arms to said head piece at said lateral side members thereof with said bottom of said support frame adapted to be received below the chin of the patient,

a flexible gas delivery tube for delivery of gas from the source of gas to the patient having a remote open end adapted for connection to the source of gas and an open end opposite said remote end, means for supporting a portion of said gas delivery tube on said frontal support frame such that the tube extends continuously along said frame side arms and said bottom, thereby defining a descending section of said tube extending from said remote end along one of said side arms, a transverse section thereof extending along said bottom, and terminating in an ascending section thereof extending along the other side arm leading to said opposite open end, means for closing the opposite open end of said tube above said ascending section thereof, and

orifice means formed in said tube at the transitions between said descending and ascending tube sections and said trans-

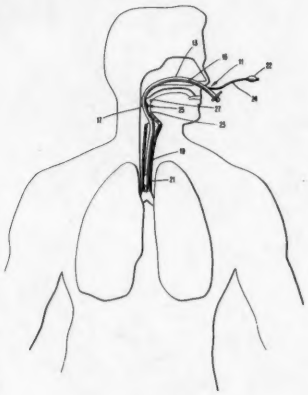
verse tube section, said orifice means being positioned in said delivery tube to direct generally lateral intersecting streams of the gas therefrom at a common region generally forward of the nose and mouth of the patient and avoiding direct impingement of said streams against the nose and mouth to provide a coalescing gas region immediately forward of the nose and mouth of the patient for breathing by the patient.

4,593,689

ENDOTRACHEAL TUBE INCLUDING MEANS FOR PATIENT COMMUNICATION

Kenneth S. White, 4910 Richardson Dr., Wilmington, N.C. 28405

Filed Apr. 15, 1985, Ser. No. 723,368
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—201.19 **7 Claims**



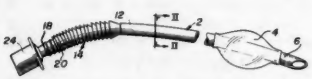
1. An endotracheal tube for allowing nasally-intubated patients to speak, comprising an elongated tube adapted for nasal intubation, said tube having means positioned adjacent a patient's throat during intubation and being operable to produce an audible tone in voice range when expired air is passed by it, means for selectively blocking and allowing passage of expired air past said tone producing means, said audible tone being alterable by the patient's lips and tongue to produce intelligible speech.

4,593,690

ENDOTRACHEAL TUBES WITH IMPROVED PROXIMAL END CONNECTOR UNITS

David S. Sheridan, Hook Rd., Argyle, N.Y. 12809, and Isaac S. Jackson, Greenwich, N.Y., assignors to David S. Sheridan, Argyle, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,822
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.15 **7 Claims**



1. In a permanently bowed endotracheal tube having an inflatable balloon cuff on its distal end, a central major lumen, a secondary minor lumen via which the cuff can be inflated and a proximal end through which the major lumen exits, an improved proximal end connector unit for connection of said tube to external fluid flow equipment which comprises:

a straight, rigid, cylindrical distal end portion having an O.D. approximately equal to said lumen of said tube,

a straight, rigid, cylindrical proximal end portion having an I.D. larger than said I.D. of said distal end portion, and

a central tubular portion joining said distal end portion to said proximal end portion, said central tubular portion being bendable in an arc of at least 180° without any substantial diminution of its effective lumen which is at least equal to the lumen of said tube,

said proximal end portion, distal end portion and central tubular portion all being integral and formed of the same thin, plastic material,

said central tubular portion comprising a plurality of circumferential, angular segments each consisting of a pair of sides that are of unequal length, said central tubular portion being compressed lengthwise with the shorter side of each of said pair being folded back under the longer side,

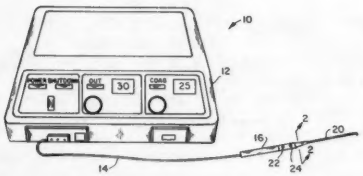
said connector unit being attached to said endotracheal tube by insertion of said distal end portion in said proximal end of said endotracheal tube.

4,593,691

ELECTROSURGERY ELECTRODE

Judy Lindstrom, Largo; W. Lane Ector, Jr., Clearwater, and Arthur F. Trott, Largo, all of Fla., assignors to Concept, Inc., Clearwater, Fla.

Filed Jul. 13, 1983, Ser. No. 513,440
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.14 **14 Claims**



1. An improved electrosurgery electrode for cooperation with an electrode holder connected to a source of electrical power and with an introducer catheter, comprising in combination:

a solid electrode shaft having a first and a second end;

a shaft connecting means for electrically connecting said first end of said electrode shaft to the electrode holder;

an electrode tip having a proximal and distal end;

said distal end of said electrode tip comprising a hook extending generally perpendicular from an axis extending through said electrode shaft;

a tip connecting means for electrically connecting said proximal end of said electrode tip to said second end of said electrode shaft thereby electrically connecting said distal end of said electrode tip;

said distal end of said electrode tip extending beyond the surface of said electrode shaft a distance generally equal to or less than the radius of said electrode shaft thereby enabling said electrode tip to pass through the introducer catheter; and

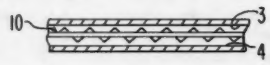
insulating means for providing electrical insulation and abrasion resistance between an exposed portion of said electrode tip and said shaft connecting means and for forming a substantially waterproof seal when said first end of said electrode shaft is connected to the electrode holder.

4,593,692

PLETHYSMOGRAPH CUFF BLADDER

Edward P. Flowers, Mountain View, Calif., assignor to Medasonics, Inc., Mountain View, Calif.

Filed Jun. 4, 1984, Ser. No. 617,232
Int. Cl.[4] A61B *17/12, 5/02;* **A61M** *29/02*
U.S. Cl. 128—327 **9 Claims**



1. An inflatable cuff bladder comprising:

a chamber having facing interior walls which is adapted to be inflated with an inflating medium and thereafter evacuated of said medium; and

means located in the interior of said chamber, said means extending from one to the other end thereof between said facing walls, for preventing the collapsing together of said facing walls and the trapping of said inflating medium in said chamber when said chamber is suddenly evacuated of said inflating medium.

6. In an inflatable cuff bladder including a chamber having facing interior walls which is adapted to be inflated with an inflating medium and thereafter evacuated of said medium, the improvement comprising:

a plurality of members which project inwardly from each of said facing interior walls, said members on one of said walls being staggered relative to said members on the other of said walls, for preventing said facing interior walls from making inflating medium trapping contact with each other when said chamber is suddenly evacuated of said inflating medium.

4,593,693

METHODS AND APPARATUS FOR ANASTOMOSING LIVING VESSELS

Robert R. Schenck, 1100 North Lake Shore Dr.-Apt. 33-A, Chicago, Ill. 60611

Filed Apr. 26, 1985, Ser. No. 727,546
Int. Cl.[4] A61B *17/11, 17/28*
U.S. Cl. 128—334 R **22 Claims**

1. Apparatus for anastomosing a first living vessel having a prepared end and an open first passageway therein to a second living vessel having a second passageway and a prepared opening, the apparatus comprising

a substantially encircling ring defining a plane and having protruding means at two or more locations for hooking said vessels thereon along said prepared end and said prepared opening, said ring having sufficient rigidity to act as the sole support of both vessels joined thereto and said protruding means having sufficient rigidity to retain both of said vessels hooked thereon, and

tab means attached to said ring providing for positioning of the ring during surgery, said tab means being displaced from the plane of the ring.

13. A microsurgical forceps comprising a pair of arms biased to an open position, a base end at which said tangs are joined together, said arms each having a maximum width sufficient to promote convenient gripping of the same by the surgeon, a neck portion narrowing the width of said forceps adjacent to the end opposite said base, and a tip having a width at least about 15 times less than the maximum width of said arms, each of said tips having a pair of prongs flanking a generally U-shaped opening.

22. A method of anastomosing a first vessel having a prepared end and a first passageway therein to a second living vessel having a prepared opening communicating with a second passageway, the method comprising

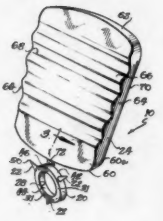
providing a substantially encircling ring having protrusions at two or more circumferentially spaced locations, said ring having sufficient rigidity to act as the sole support of both vessels joined thereto and said protrusion having sufficient rigidity for retaining both of said vessels hooked thereon,

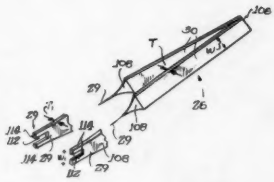
providing a microsurgical forceps comprising a pair of tangs joined at a base end and each tang having a tip at the other end, which tips together are proportioned to fit through the opening in said ring, each of said tips having two prongs flanking a generally U-shaped opening,

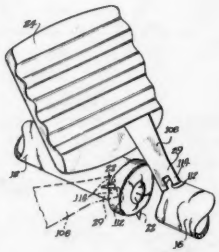
positioning said ring adjacent to the end of the first vessel,

drawing said first vessel end through the ring,

pulling with said forceps a portion of the wall of said first vessel radially outward, positioning the aligned U-shaped







openings of the forceps tips with the outer extremity of one or said protrusions and impaling said first vessel end so that said prongs flank said protrusion, and then sliding said forceps away from said protrusion leaving said vessel wall portion impaled thereon,

in a similar manner pulling other portions of the wall of said first vessel and impaling the same on the other protrusions, and

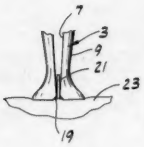
then in a similar manner pulling portions of the wall of the second vessel and hooking the same on each of said protrusions, in turn, thereby apposing the two vessels and anastomosing the same together.

4,593,694

TWEEZERS

George F. Langenbach, Jr., 9127 Pardee Spur, Crestwood, Mo. 63126, assignor to George Langenbach, Crestwood, Mo.

Filed Aug. 1, 1983, Ser. No. 519,061
Int. Cl.[4] A61B *17/30*; B25B *9/02*
U.S. Cl. 128—354 1 Claim



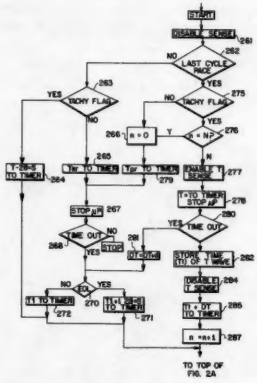
1. Tweezers for withdrawing hair from the skin comprising a pair of legs, said legs terminating in free ends having flat opposing inner surfaces and outer surfaces which flare outwardly at said free ends to form broad flat feet for contacting the skin and for directly gripping a hair near the base thereof between the opposing inner surfaces of said feet, the bottom surfaces of said feet being generally semicircular in shape, the arc of said semicircle defining the outer edge of each foot and the chord line of said semicircle defining the inner edge of each foot, so that when the feet are squeezed together the bottom of the feet generally form a circle, the inside surfaces of the feet being slightly relieved at the opposing bottom edges thereof so that the feet may be squeezed together directly to grip a hair without pinching the flesh.

4,593,695

PACEMAKER WITH IMPROVED TACHYCARDIA TREATMENT MEANS AND METHOD

Frederik H. M. Wittkampf, Brummen, Netherlands, assignor to Vitafin N.V., Dieren, Netherlands

Continuation-in-part of Ser. No. 583,175, Feb. 24, 1984, abandoned. This application Apr. 23, 1984, Ser. No. 603,119
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG 22 Claims



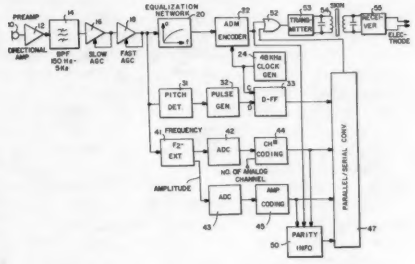
1. A method of terminating tachycardia in a patient, comprising
determining the occurence of tachycardia;
determining the timing of a T-wave portion of a patient heartbeat; and
delivering an A-T treatment stimulus a predetermined time after said T-wave portion.

4,593,696

AUDITORY STIMULATION USING CW AND PULSED SIGNALS

Ingeborg J. Hochmair, and Erwin S. Hochmair, both of A-1130 Wien Jaunerstrafse 27, Vienna, Austria

Filed Jan. 17, 1985, Ser. No. 692,246
Int. Cl.[4] A61N *1/18*
U.S. Cl. 128—419 R 18 Claims



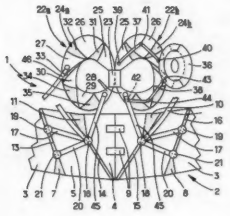
1. An auditory stimulating system comprising
sound processing means for generating analog and pulsatile signals in response to audio signals,
transmission means for transmitting at least one analog signal indicative of audio sounds and at least one pulsatile signal indicative of features of audio sounds,
receiver means for receiving said at least one analog signal and at least one pulsatile signal,
a multi-electrode prosthesis for stimulating the cochlea of a patient, and
means interconnecting said receiver means and said multi-electrode prosthesis whereby said analog signal and said pulsatile signal concurrently stimulate the auditory nerve.

4,593,697

EXTERNAL APPLIANCE FOR THE TRUNK OF THE BODY

Guy J. Salort, 219, rue Raymond Losserand, 75014 Paris, France

Filed Feb. 13, 1985, Ser. No. 701,177
Claims priority, application France, Feb. 14, 1984, 84 02202
Int. Cl.[4] A41C *1/00*
U.S. Cl. 128—538 22 Claims



1. An external appliance for the trunk of the body, characterised in that it comprises two composite structures, a first structure being a lower structure having a general frustoconical external shape, for encircling the pelvis and the abdomen of a weareer of the appliance and formed by a pelvic corset extending substantially from the bi-trochanterian perimeter at the bottom up to, on one hand, substantially the navel, at the top at the front and, on the other hand, up to the lower half of the lumbar column, at the top at the rear, the said corset comprising:

a plurality of semi-rigid elements connected by flexible and pliant members and regulatory elastic means connecting each of the two portions of the corset located perpendicular to the two anterior superior iliac spines to the portion of the corset located perpendicular to the homolateral sacro-iliac joint, on one hand, and to the portion of the corset located perpendicular to the homolateral ischium, on the other hand,

the second composite structure being an upper structure comprising two symmetrical hemithoracic envelopes each having a general frustoconical external shape and each surrounding a hemithorax, the two hemithoracic envelopes having a common sterno-xyphoidian portion and each having two sub-assemblies, one of which is a scapular sub-assembly and the other an inferior lateral thoracic sub-assembly, each of these two sub-assemblies being constituted by a plurality of semi-rigid elements connected by flexible and pliant members, the regions of the axially space and the breast remaining free, the upper structure also comprising:

a dorsal elastic articulation, centered at the apex of the dorsal column and connecting the two hemi-thoracic envelopes together in a detachable manner, and

regulatory elastic means connecting, on each of the two hemithoracic envelopes, on one hand, the semi-rigid elements of the scapular sub-assembly and, on the other hand, the semi-rigid elements of the thoracic sub-assembly, the two said composite structures being connected together by means for linking and regulating the dynamic equilibrium of the appliance, which comprises:

two front lever springs, tensioned between one of the two portions of the corset located perpendicular to the anterior superior iliac spines and the homolateral portion of the sterno-xyphoidian common portion, the said lever springs being designed to take into account the deformations due to flexion and/or torsion of the trunk and to regulate the relative movements of the vertebral column, the pelvis and the thoracic assembly,

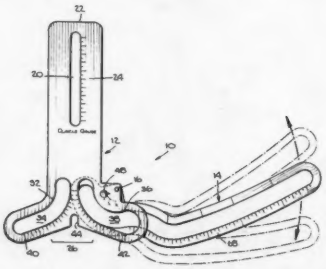
two lateral posterior tighteners connecting in each case the sub-spinal zone of the scapular sub-assembly of one of the hemithoracic envelopes to the portion of the corset located perpendicular to the iliac spine of the opposite side, the said tigheners being designed to prevent the thorax from falling forwards.

4,593,698

ELECTROCARDIOGRAPH SENSOR POSITIONING DEVICE AND METHOD

Robert J. Athans, 21 Meadow Ave., Bronxville, N.Y. 10708

Filed Nov. 21, 1984, Ser. No. 673,668
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—644 **20 Claims**



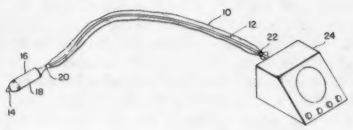
1. An electrocardiograph sensor positioning device comprising, first and second sensor locating members angularly adjustable with respect to each other to a determinable angular position, cooperative indicia means on said first and second sensor locating members for providing an indication of said angular position, zone locating means on said first and second sensor locating members for defining location zones for a plurality of electrocardiograph sensors, and zone indicia means at said zone locating means for providing an indication of the respective locations of said electrocardiograph sensors when said electrocardiograph sensors are positioned in respective said location zones.

4,593,699

STERILE COVER FOR INTRAOPERATIVE ULTRASONIC DIAGNOSTIC DEVICES AND METHOD AND KIT FOR PROVIDING SAME

Richard P. Poncy, 5105 Woodland Lakes Dr., and Mark P. Poncy, 5125 Woodland Lakes Dr., both of Palm Beach Gardens, Fla. 33410

Filed Jun. 13, 1983, Ser. No. 503,838
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **18 Claims**



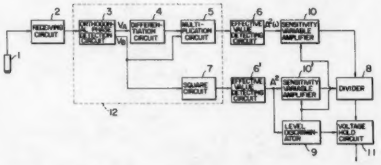
1. A method of providing a sterile cover over a sonic probe and flexible connecting cable of a sonic imaging instrument, said cable extending between said probe and a sonic imaging instrument, comprising placing a flexible sleeve, open at both ends and having a sterile exterior surface, over said cable and said probe with a distal end of said probe protruding from one end of said sleeve, and placing a flexible sheath, open at one end and closed at the other end and having a sterile exterior surface, over at least the distal end of said probe and over said one end of said sleeve.

4,593,700

ULTRASONIC WAVE BLOOD FLOW METER

Yoshihiro Hayakawa, Sagamihara; Yasuhiro Nakamura, Tokyo; Ryobun Tachita, and Tsutomu Yano, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 5, 1984, Ser. No. 647,489
Claims priority, application Japan, Sep. 8, 1983, 58-165520
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—663 **4 Claims**



1. An ultrasonic flow meter for measuring the rate of flow of a fluid comprising

probe means for sending and receiving an ultrasonic signal which impinges on said fluid and is reflected therefrom;

detecting means coupled to said probe means for converting frequency variations in said reflected ultrasonic signal due to the Doppler effect into a first signal having an amplitude which varies with frequency and a second signal having an amplitude which is constant and independent of frequency, each of said first and second signals having a d.c. component;

first and second effective-value detecting means coupled to said detecting means, said first and second effective-value detecting means detecting the d.c. components of said first and second signals respectively;

level discrimination means coupled to the output of said second effective-value detecting means, said level discrimination means determining the magnitude of the d.c. component of said second signal;

first and second sensitivity-variable amplification means coupled to the outputs of said first and second effective-value detecting means respectively and to the output of said level discrimination means, the sensitivity of said first and second amplification means being varied in accordance with the output of said level discrimination means;

dividing means coupled to the outputs of said first and second sensitivity-variable amplification means, said dividing means dividing the d.c. component detected by said first effective-value detecting means and amplified by said first sensitivity-variable amplification means by the d.c. component detected by said second effective-value detecting means and amplified by said second sensitivity-variable amplification means; and

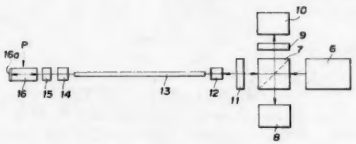
hold means coupled to the outputs of said dividing means and said level discrimination means for holding the output of said divider means in accordance with the output of said level discrimination means.

4,593,701

CATHETER-TIP MICROMANOMETER UTILIZING SINGLE POLARIZATION OPTICAL FIBER

Kenji Kobayashi, Yokohama; Tsutomu Yasuda, Kawasaki; Hiroshi Matsumoto, Higashi Kanamachi, and Humiki Sone, Hitachi, all of Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Aug. 22, 1984, Ser. No. 643,291
Claims priority, application Japan, Apr. 16, 1984, 59-77100
Int. Cl.[4] A61B *5/02, 5/00*
U.S. Cl. 128—667 **11 Claims**



1. A catheter-tip micromanometer utilizing a single polarization optical fiber, the micromanometer comprising:

a photoelastic element, the light, propagation constants of which change in two axes perpendicular to each other along a propagating direction in accordance with blood pressure to be applied thereto;

a single polarization optical fiber, one end of which faces an incidence point of said photoelastic element, said fiber having a linearly polarized axis which is positioned at a prescribed angle with respect to one of said two axes of said photoelastic element;

a light reflecting means positioned at an opposite side of said photoelastic element facing said one end of the single polarization optical fiber;

a light source means positioned to face the other end of said single polarization optical fiber for emitting light which propagates along said linearly polarized axis of said single polarization optical fiber and reaches said incidence point of said photoelastic element; and

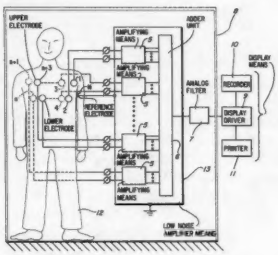
a detection means for detecting blood pressure to be applied to said photoelastic element based on the light emitted from said light source means and the reflected light reflected by said reflecting means and from the other end of said single polarization optical fiber back through said photoelastic element and to said single polarization optical fiber.

4,593,702

MEASURING SYSTEM FOR THE ELECTRICAL ACTIVITY OF THE HEART CONDUCTING SYSTEM ON THE BEAT-TO-BEAT BASIS BY A NONINVASIVE METHOD

Roman Kepski; Franciszek Walczak; Zbigniew Plucinski, and Adam Piatkowski, all of Warsaw, Poland, assignors to Osrodek Badawczo-Rozwojowy Techniki Medycznej "Ormed", Warsaw, Poland

Filed Oct. 18, 1982, Ser. No. 434,903
Claims priority, application Poland, Oct. 22, 1981, 233539[U]
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—696 **7 Claims**



1. A system for measuring electrical activity of a heart conduction system in a patient's body from excitation to excitation during a single beat of the heart by a noninvasive method, comprising:

at least two parallel channels, each channel defining a measuring track having a pair of electrodes, an upper electrode of said pair adapted to be located on the body not lower than the auricle level of the heart and a lower electrode of said pair adapted to be located on the body no higher than the ventricle level of the heart, means electrically connecting the electrodes of each pair to an amplifying means for producing amplified signals from each pair of electrodes during a heart beat;

an adder means coupled to said amplifying means for summing the amplified signals from said electrode pairs to produce a sum signal;

a filtering means connected to said adder means for filtering the sum signal to produce a filtered signal;

display means connected to said filtering means for displaying the filtered signal; and

a reference electrode adapted for application to the body, the reference electrode being connected to a common ground for the electrode pairs of each of the measuring tracks.

4,593,703

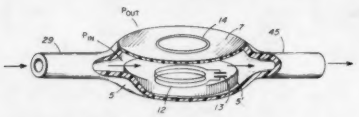
TELEMETRIC DIFFERENTIAL PRESSURE SENSOR WITH THE IMPROVEMENT OF A CONDUCTIVE SHORTED LOOP TUNING ELEMENT AND A RESONANT CIRCUIT

Eric R. Cosman, 872 Concord Ave., Belmont, Mass. 02178

Continuation of Ser. No. 262,668, May 11, 1981, abandoned, which is a continuation of Ser. No. 908,615, May 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 895,953, Apr. 13, 1978, Ser. No. 895,954, Apr. 13, 1978, Pat. No. 4,281,667, Ser. No. 895,955, Apr. 13, 1978, Pat. No. 4,206,761, Ser. No. 895,956, Apr. 13, 1978, Pat. No. 4,206,762, Ser. No. 697,948, Jun. 21, 1976, abandoned, and Ser. No. 697,951, Jun. 21, 1976, abandoned. This application May 17, 1984, Ser. No. 611,063
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—748 **15 Claims**

1. A telemetric in vivo differential pressure sensitive device adapted for implantation in the living body, the device including:

(a) a housing;
(b) a generally planar flexible diaphragm fluid pressure sealed with respect to and supported by said housing so that said flexible diaphragm communicates on its opposite sides with pressures in two regions external to said device when the device is adapted to be implanted in the living body whereby a change in the difference of the two external pressures will produce a displacement of at least a portion of the flexible diaphragm;
(c) a telemetry electronic circuit including a coil inductor mounted on said housing, said circuit having a telemetered



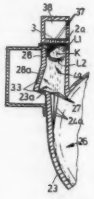
characteristic response parameter that changes upon a change in the inductance of said coil inductor, and;
(d) a single shorted generally planar loop of electrically conductive material coupled to the coil inductor of said telemetry electronic circuit and mounted with respect to and movable with said flexible diaphragm so that displacement of said at least a portion of the flexible diaphragm changes the inductance of the coil inductor whereby the telemetered characteristic response parameter changes as a function of the displacement of said at least a portion of the flexible diaphragm.

4,593,704

METHOD OF AND APPARATUS FOR BUILDING A COMPOSITE TOBACCO STREAM

Günter Wahle, Reinbek; Dieter Ludszeweit, and Uwe Heitmann, both of Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,733
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244535
Int. Cl.[4] A24C *5/18, 5/39*
U.S. Cl. 131—84.3 **40 Claims**



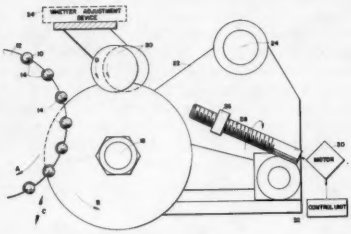
1. A method of producing a composite tobacco stream on an elongated air-permeable conveyor having first and second sides and longitudinally extending first and second marginal portions, comprising the steps of moving the conveyor lengthwise in a predetermined direction; establishing a pressure differential between the two sides of the conveyor so that air flows from the first to the second side; supplying particles consisting of or containing a first type of tobacco largely onto the marginal portions of the first side of the conveyor whereby the particles are retained by the conveyor as a result of the establishment of said pressure differential and form thereon a first tobacco layer having, as a result of non-uniform distribution of tobacco particles at the first side of the conveyor, a concave surface facing away from the first side; covering a central portion of the concave surface with a core consisting of or containing tobacco particles of a second type and having a width less than that of the first layer so that portions of the concave surface at the opposite sides of the core remain exposed; and applying over the core and over the exposed portions of the concave surface a second layer consisting of or containing tobacco particles of the first type so that the core is at least substantially confined between the two layers.

4,593,705

SLITTER KNIFE ADVANCE UNIT AND METHOD OF USE

Martin T. Garthaffner, Midlothian, Va., assignor to Philip Morris Inc., New York, N.Y.

Filed Jan. 5, 1984, Ser. No. 568,434
Int. Cl.[4] A24C *5/30*
U.S. Cl. 131—84.4 **13 Claims**



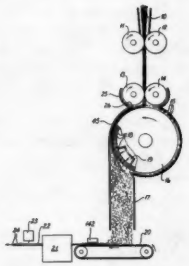
1. An apparatus for cutting a rod-shaped article such as a tobacco rod or a filter plug rod, said apparatus comprising:
a rotatable slitter knife;
means for supporting a rod-shaped article at a predetermined position to be out by said slitter knife;
whetter means adjacent said slitter knife for whetting said slitter disc while said slitter knife rotates; and
adjustment means for automatically adjusting the position of said slitter knife to maintain it in whetting engagement with said whetter means.

4,593,706

PRODUCING FILLER MATERIAL, PARTICULARLY FOR CIGARETTE FILTERS

Edward G. Preston, London, England, and David B. Stewart, Dundee, Scotland, assignors to Molins Limited, Great Britain

Filed Aug. 3, 1981, Ser. No. 289,481
Claims priority, application United Kingdom, Aug. 4, 1980, 8025342; Dec. 12, 1980, 8039931
Int. Cl.[4] A24C *5/14;* **B31C** *13/00;* **B32B** *19/00*
U.S. Cl. 131—109.1 **25 Claims**



1. Apparatus for producing filler material for products of the cigarette industry from a substantially continuous stream of filaments, including a conveyor having a surface carrying sharp projections adapted to engage said filaments, means for feeding and guiding the stream towards the conveyor and into

engagement with said sharp projections, means for driving the conveyor at a high speed relative to the stream of filaments such that end portions of the filaments of the stream are rapidly accelerated as they are engaged by said projections so that said filaments are broken into irregular lengths, and means for receiving the broken filaments in a stream in which they are at least initially randomly oriented.

4,593,707

VARIABLY VENTILATED FILTER CIGARETTE

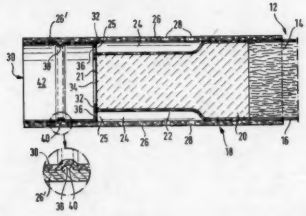
Henning Seidel, Lueneburg; Wolfgang Wildenau, Hamburg, and Joachim Mantke, Hitzhusen, all of Fed. Rep. of Germany, assignors to H.F. & Ph.F. Reemtsma GmbH & Co., Hamburg, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 744,765

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422776; May 10, 1985, 3516841

Int. Cl.[4] A24D *3/00, 1/04*

U.S. Cl. 131—336 **14 Claims**



1. A filter cigarette having a generally cylindrically shaped filter body at one end thereof having a substantially air impermeable sleeve surrounding said filter body, said filter body having an exterior surface and a plurality of channel means formed in said exterior surface with said channel means being circumferentially spaced apart, wrapping sheet means surrounding said filter body and having at least a portion thereof permeable to the air, each said channel means having a first end in communication with the air through a said portion of said wrapping sheet means and a second end disposed for flow communication with the mouth of the user, said wrapping sheet means including an end portion, a cup-shaped member rotatably disposed in said end portion, said cup-shaped member having an end wall having a plurality of circumferentially spaced openings and a central opening in flow communication with said filter body, said spaced openings being disposed radially outwardly of said central opening a distance such that said spaced openings can be moved into and out of registry with a selected second end of a respective said channel means upon rotation of said cup-shaped member relative to said wrapping sheet means.

4,593,708

HEATED BRISTLE CURLING BRUSH

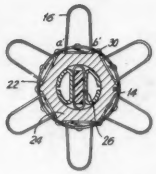
Loretta D. Goeller, Rowayton, and Jorgen Skovdal, Trumbull, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Apr. 9, 1984, Ser. No. 597,950

Int. Cl.[4] A45D *1/00*

U.S. Cl. 132—9 **2 Claims**

1. In an internally heatable hair curling brush comprising a handle, a barrel extending from said handle, said barrel having a longitudinal axis, an outer heat conducting cylindrical surface radially spaced from the longitudinal axis and a heater for heating same, the improvement which comprises a plurality of arch-shaped, heat conducting loop bristles spaced around and in heat conducting relationship with said outer cylindrical surface, said bristles arranged in a plurality of parallel, axially spaced bristle groups, each one of said groups comprising a plurality of said bristles, the base of each of said bristles subtending a predetermined arc on said outer cylindrical surface, the number of bristles in any one of said groups being such that



a predetermined arcuate gap exists between the bases of adjacent bristles in a group, the bristles of all said groups axially aligned with each other to form longitudinal rows of said bristles.

4,593,709

MACHINE FOR SORTING, PACKAGING AND DISPENSING OF COINS

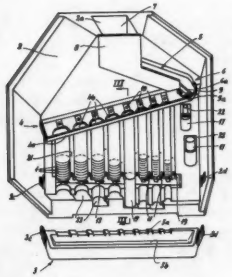
Christian J. Duplessy, Les Hoteaux, Brindas (Rhone), France

Filed May 29, 1984, Ser. No. 614,871

Claims priority, application France, May 27, 1983, 83 09117

Int. Cl.[4] G07D *3/04*

U.S. Cl. 133—3 D **7 Claims**



1. A coin-sorting, packaging and dispensing machine, comprising:

a support;

a downwardly inclined ramp on said support having an outer edge and an inner edge;

means including a plurality of sorting plates secured on said ramp at spaced-apart locations therealong defining respective holes of successively increasing diameter and positioned so that an edge of a hole remote from said outer wall is slightly greater than the diameter of a coin adapted to pass through said hole;

means for feeding coins to said ramp at an upper end thereof whereby said coins slide down said ramp along said wall and tumble through respective holes;

respective downwardly open collecting tubes registering with said holes below said ramp for accumulating stacks of coins of the size corresponding to the size of the respective hole; and

a U-section channel having a front flange and a rear flange, said bar having a downwardly extending finger enabling the displacement thereon rearwardly through openings provided in said flanges and an upstanding lug, said support being formed with a respective seat beneath each tube for receiving a guide sleeve over which a transparent foil sack is drawn, said sleeve, upon being positioned

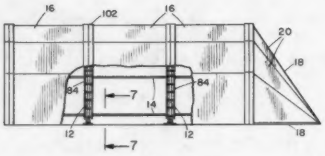
below the respective stack, pressing a respective finger and support bar back to free a respective stack of coins whereby said sleeve guides said coins into the respective sack.

4,593,710

FRAMED TENSION STRUCTURE

Robert Stafford, Newport Beach, and Gregory Cook, San Diego, both of Calif., assignors to Fabric and Structure Technology, Inc., Newport Beach, Calif.

Filed Jul. 16, 1984, Ser. No. 631,141
Int. Cl.[4] E04B *1/32*
U.S. Cl. 135—102 **4 Claims**



1. A building structure comprising:
a plurality of longitudinally spaced arch frames extending transversely in generally vertical planes;
a plurality of spreaders extending longitudinally between and rigidly connecting the frames;
a plurality of rectangular sections of a flexible web material, each web section having a width corresponding to the longitudinal distance between adjacent ones of the frames and a length corresponding to the traverse extension of the frames;
first means mounted on the frames for adjustably tensioning each web section across its width between a corresponding adjacent pair of frames; the first tensioning means includes:
a plurality of ladder-like mechanisms each having a pair of parallel rails,
a plurality of rungs connecting the rails;
means for adjusting the spacing between the rails;
means for attaching the rungs of each ladder-like mechanism to a corresponding frame so that the rails extend transversely; and
means on each rail for retaining a lengthwise edge of a corresponding web section; and
second means connected to the frames for adjustably tensioning each web section in the direction of its length.

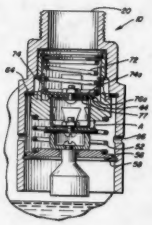
4,593,711

PRESSURE AND VACUUM RELIEF VALVE MECHANISM FOR A FLUID STORAGE TANK

Carrol V. Morris, Cosby, Mo., assignor to Mercury Metal Products, Inc., Schaumburg, Ill.

Filed Dec. 3, 1984, Ser. No. 677,290
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—39 **8 Claims**

1. A valve mechanism for relief of excessive pressure or vacuum in the interior of a closed fluid storage tank, said mechanism adapted to be installed in a vent opening in a wall of the tank and exposed to said tank interior, comprising:
A. a valve housing having a bore therethrough including an opening at one end thereof communicating with ambient atmosphere at said vent opening, passage means in said housing for communicating said bore with said tank interior, and a first valve seat within said bore;
B. a unitary valve member movably positioned within the bore of said housing, said valve member including at least a second valve seat and a separate valve component integral therewith, and conduit means for communicating between the interior of the valve member and valve housing; and
C. spring means biasing said unitary valve member toward engagement of said valve component with said first valve seat, and spring biased valving means engageable with said second valve seat to form separate, respective first and second normally-closed operable valves in the bore of the valve housing, said first valve being independently operable to establish communication between the tank interior and ambient atmosphere through said passage means, said bore, said conduit means and vent opening for relief of excessive pressure within said tank interior, said second valve being independently operable to establish



communication between ambient atmosphere and said tank interior through said vent opening, said conduit means, said bore and said passage means to relieve excessive vacuum within said tank interior without spillage of the fluid product in the tank, and
D. a third valve seat formed on said unitary valve member, and an overturn valve operably installed in the bore and in cooperation with said third valve seat on said unitary valve member for closing movement between said overturn valve and said third valve seat for preventing fluid product leakage through the vent opening when said tank is excessively tilted or overturned or said tank is jolted during transport thereof.

4,593,712

PILOT CONTROL VALVE

Anthony J. Quartana, III, 111 Derreck Rd., Belle Chasse, La. 70037

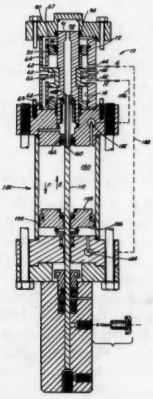
Filed Oct. 24, 1984, Ser. No. 664,314
Int. Cl.[4] F15B *9/08*
U.S. Cl. 137—106 **20 Claims**

1. A pilot control valve comprising
a. a valve body;
b. an elongated bore within said body;
c. a fluid inlet port;
d. first and second fluid outlet ports;
e. a first valve member slidable within said bore;
f. a second valve member unconnected to said first valve member and slidable within said bore and being selectively shiftable between first and second positions, said second valve member presenting first and second pressure surfaces on said valve member selectively exposed to fluid from said fluid inlet port;
said first valve member being selectively shiftable between first and second positions and presenting first and second pressure surfaces on said valve member, said second pressure surface being selectively exposed to fluid from said fluid inlet and said first pressure surface being selectively exposed to means for imparting longitudinal movement of said first valve member from said second to said first position thereof:
said first position of said first valve member allowing communication between said fluid inlet port and said first pressure surface of said second valve member and

precluding communication between said fluid inlet port and said second pressure surface of said second valve member, and

said second position of said first valve member allowing communication between said fluid inlet port and said second pressure surface of said second valve member and precluding communication between said fluid inlet port and said first pressure surface of said second valve member;

a greater total force on said first pressure surface than on said second pressure surface of said second valve member moving said second valve member to said second



position of said second valve member allowing communication between said fluid inlet port and said second fluid outlet port moving said first valve member to its second position,

a greater total force on said second pressure surface than on said first pressure surface of said second valve member moving said second valve member to said first position of said second valve member allowing communication between said fluid inlet port and said first fluid outlet port moving said first valve member to said first position.

4,593,713

MEASUREMENT COUPLING

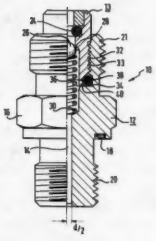
Arnold Menshen, Beulerweg 52, D-5982 Neuenrade, Fed. Rep. of Germany

Filed Sep. 20, 1984, Ser. No. 652,689

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 8327013[U]

Int. Cl.[4] F16L *29/00*; F16K *51/00*

U.S. Cl. 137—322 **4 Claims**



1. A measurement coupling device comprising a first coupling portion of metal having an axially directed through bore with internal screw threads extending along a portion of said bore and terminating at a flat radially directed shoulder, a second coupling portion of high tensile steel having an axially directed bore with valve means therein, said second coupling member having external screw threads disposed in threaded engagement with said internal screw threads and an end portion having an outer surface extending obliquely with respect to the axial direction and intersecting the bore therein to define a circular edge which engages said shoulder with circular line contact to limit movement of said second coupling member relative to said first coupling member, to provide a metal-to-metal seal and define a chamber between said first and second coupling portions and a seal member disposed in said chamber with said metal-to-metal seal preventing overloading of said seal member.

4,593,714

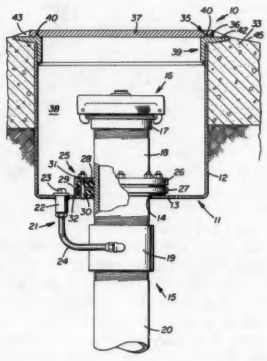
MANHOLE ASSEMBLY WITH WATER BARRIER

Michael J. Madden, 16237 Illinois Ave., Paramount, Calif. 90723

Filed Jun. 19, 1984, Ser. No. 622,076

Int. Cl.[4] F16L *5/00*

U.S. Cl. 137—371 **17 Claims**



1. A manhole assembly adapted for connection to a fill pipe for an underground storage tank comprising

a unitary and impervious hollow body defining a chamber therein and terminating at an annular upper surface extending at least generally horizontally from an interior edge to an exterior edge thereof,

an annular cover removably mounted in abutted relationship solely on the upper surface of said body and covering said chamber, and

dam means solely defined circumferentially, continuously and entirely between the upper surface of said body and an underside of said cover for forming a barrier for preventing the ingress of liquid radially inwardly over said surface and into said chamber, said dam means disposed between the interior and exterior edges of said surface and vertically thereabove and comprising at least one annular

barrier flange formed in upstanding relationship on said upper surface and an annular groove formed on the underside of said cover and having said barrier flange disposed in nested relationship therein.

4,593,715

HYDRAULIC CONTROLLABLE TWO-PORT VALVE FOR A LIQUID STREAM

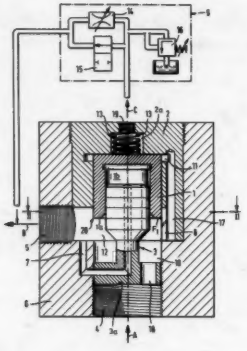
Bodo Stich, Wiesbaden; Ernst Hassler, Bad Camberg/Würges; Slawomir Adamowicz, Taunusstein, all of Fed. Rep. of Germany, and Ivan J. Cyphelly, Gran Canaria, Spain, assignors to GLYCO-Antriebstechnik GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,123

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 3343620

Int. Cl.⁴ F16K *17/28*

U.S. Cl. 137—503 **10 Claims**



1. A pressure and flow control value for a liquid medium which comprises:

a value body formed with an inlet and with an outlet for a main flow of said medium;

a differential piston slider received in said body and shiftable to define a main flow opening cross section between said inlet and said outlet, said slider being positioned and constructed to have small effective surface exposed to the inlet pressure of said main flow;

means forming a throttle slit communicating with a spring compartment formed in said body and in which a large effective surface of said slider is exposed to a control flow of said medium passing through said throttle slit to said spring compartment;

a spring in said spring compartment bearing upon said slider, sid throttle slit defining with said slider a variable control opening cross section dependent upon the position of said slider in said body;

means forming a flow chamber connected with said inlet and communicating with said throttle slit through said control opening cross section; and

a control valve set communicating through a control port formed in said body with said spring compartment for establishing a pressure in sais spring compartment to control the position of said slider in said body, said slider being formed with a control edge defining both said control opening cross section and said main flow cross section, said slider being received in an axial bore formed in said body and said slit being formed in a wall of said bore.

4,593,716

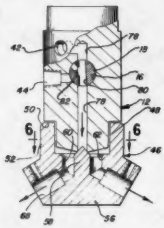
CONTROL VALVE ASSEMBLY FOR ABRASIVE SLURRY

Joseph V. Cesna, Niles, Ill., assignor to Speedfam Corporation, Des Plaines, Ill.

Filed Aug. 28, 1980, Ser. No. 182,125

Int. Cl.⁴ F17D *1/14;* **F16K** *5/04;* **B24B** *57/02*

U.S. Cl. 137—561 A **3 Claims**



1. A valve assembly for controlling the flow of abrasive slurry to the lapping wheel of a lapping machine or the like, said valve assembly comprising, in combination, a manually operable rotatable spool located adjacent an abrasive slurry valve inlet passage for controlling the amount of abrasive slurry to be conducted to said lapping wheel, a generally vertical passage leading downwardly from said rotatable spool for carrying abrasive slurry to be conducted to said lapping wheel, said spool being rotatable between a first limiting position where substantially all of the abrasive slurry received at said inlet passage is conducted down said generally vertical passage for delivery to said lapping wheel and a second limiting position where substantially all of the abrasive slurry received at said inlet passage is conducted to a return passage from which it is recirculated to a supply pump, and a 4-way splitter member positioned at the lower end of said generally vertical passage for dividing said abrasive slurry into four approximately equal amounts for delivery to four different areas on said lapping wheel, said splitter member including an upwardly directed divider arm having a tip which extends partly up into the lower end of said generally vertical passage, and four separate passages surrounding said tip and in communication with said generally vertical passage for receiving approximately equal amounts of abrasive slurry from said generally vertical passage for delivery to different locations on said lapping wheel.

4,593,717

VALVE

Joseph E. Levasseur, P.O. Box 25163, Richmond, Va. 23260

Filed Aug. 12, 1983, Ser. No. 522,563

Int. Cl.⁴ F16K *37/00, 11/085*

U.S. Cl. 137—556.6 **18 Claims**

1. A valve for clinical use in connecting tubing for administering fluids comprising:

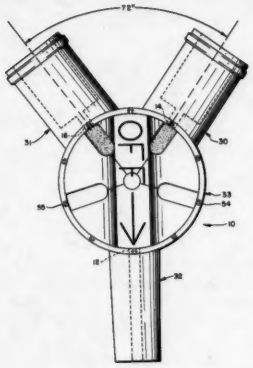
(a) a housing having three ports; a first port, a second port, and a third port;

(b) said first port being spaced equi-distantly between said second and third ports, said second and third ports being spaced more closely than said first and second and said first and third ports;

(c) selector means communicating with said ports and movable among four positions, a first position connecting said first and second ports for fluid flow while blocking flow to said third port, a second position connecting said first and third ports for fluid flow while blocking flow to said second port, a third position connecting said second and third ports and flow while blocking flow to said first port, and a fourth position blocking flow among all three ports; and

(d) said selector means being movable among at least five

open positions to communicate one or more housing ports with another housing port, each open position being equally spaced about said housing, and five off positions



where none of the housing ports are communicated with each other, each off position being located between adjacent open positions and equally spaced about said housing.

4,593,718

PRESSURE AGENT CONTROL ARRANGEMENT FOR AUXILIARY POWER STEERING MECHANISMS

Armin Lang, Schwabisch Gmund, and Helmut Knodler, Lorch, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

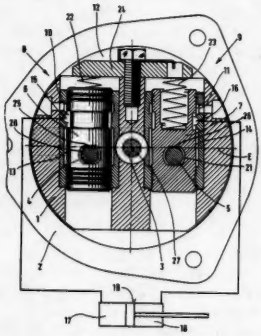
PCT No. PCT/EP84/00132, § 371 Date Mar. 15, 1985, § 102(e) Date Mar. 15, 1985, PCT Pub. No. WO85/00564, PCT Pub. Date Feb. 14, 1985

PCT Filed May 4, 1984, Ser. No. 713,407

Claims priority, application Luxembourg, Jul. 23, 1983, 00197

Int. Cl.[4] F15B *13/02*

U.S. Cl. 137—596 **9 Claims**



1. In a booster steering system valve control for a servomotor, of the kind having actuator pins (4, 5; 30, 31) rotative about an axis 27 and actuably engaging valve pistons (6, 7; 32, 33) in a rotative valve body, reciprocal on respective axes, wherein spring means (22, 23; 36) are carried by said valve body biasing said actuator pins to effect engaged surfaces between said actuator pins and respective valve pistons within openings in respective valve pistons for actuation thereof:

the improvement wherein the engaged surfaces and the axis (27) are disposed approximately in the same plane (E) which is substantially normal to the axes of said valve pistons to minimize frictional resistance by reducing relative movement between said actuator pins and respective valve pistons.

4,593,719

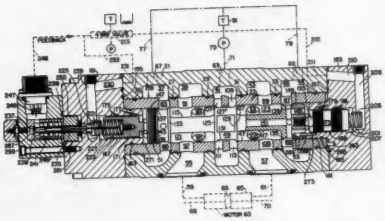
SPOOL VALVE

Willie B. Leonard, 5902 Royalton, Houston, Tex. 77036

Filed Nov. 30, 1984, Ser. No. 676,702

Int. Cl.[4] F15B *13/043*

U.S. Cl. 137—625.66 **6 Claims**



1. Spool valve comprising:

a body having an elongated cavity, a spool longitudinally reciprocably mounted in said cavity,

said body having a central inlet port adapted for connection to a source of pressure fluid, near each end of the cavity an outlet port adapted for connection to a volume of lower pressure than said source, and two flow ports one at each side of said inlet port between the inlet port and one of said outlet ports, each flow port being adapted to be connected to a motor,

cooperable means on said body and spool controlling fluid flow through said body between said ports, said means comprising a plurality of annular lands on said spool, there being such a land between each adjacent pair of said ports,

said spool having at each end annular guide means engaging the inner periphery of the cavity next to the adjacent end of the cavity,

said valve including two actuation means, one at each end of the spool and each including:

a cylinder formed in said body communicating with one end of said cavity, with the cylinder axis extending in the same direction as the line of reciprocation of the spool, and a piston mounted in the cylinder for reciprocation along the cylinder axis and operatively associated with the end of said spool at said one end of the cavity to move said spool away from said cylinder when said piston is moved toward the other end of said cavity,

said cylinder and cavity having different cross-sectional areas adjacent the junction of said piston and spool whereby the volume defined by said cylinder and cavity between said piston and spool varies according to the position of said spool as it is reciprocated within said cavity, and

passage means at each end of the spool disposed entirely within the inner periphery of said cavity and extending through the guide means at the respective end of the spool and communicating with the outlet port near that end of the body in all positions of said spool relative to said body, thereby connecting said volume directly with the last said outlet port upstream from where it is adapted for connection to said volume of lower pressure.

4,593,720

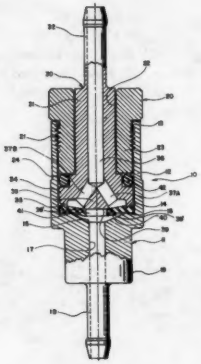
FILLING NOZZLE VALVE STRUCTURE

Wieslaw Bergandy, Arnold, Md., assignor to National Instrument Company, Inc., Baltimore, Md.

Filed Dec. 20, 1983, Ser. No. 563,456

Int. Cl.[4] F16K *15/14*

U.S. Cl. 137—859 **17 Claims**



1. A filling nozzle valve structure having a flow direction, comprising a first housing member provided with a chamber-like recess terminating in an outlet bore, annular diaphragm means in said recess provided with a central hole, valving means in said recess and operable to engage with said diaphram means, and a second housing member having a central bore and operable to be screwed together with said first housing member and to hold said valving means in place within said recess, said valving means being provided with a central inlet bore for a product to be filled, characterized in that said valving means is provided at its end in the chamber-like recess with two radially spaced annular diaphragm-engaging surface means leaving therebetween an area provided with discharge bore means in communication with said inlet bore, one of said surface means which is located radially outwardly of the other surface means, being operable to engage with the radially outer area of the annular diaphragm means so as to prestress the radially outer area in the flow direction about a fulcrum area located intermediate the two surface means to thereby cause the radially inner area of the annular diaphragm means to be stressed in a direction opposite said flow direction so as to engage with the outer surface means and to thereby hold the valve structure in closed condition by said prestress while enabling opening of the valve structure in the presence of a product under predetermined pressure causing disengagement of the inner annular area of the diaphragm means from the second surface means.

4,593,721

TUBULAR PACKAGING CASING

Ludwig Klenk, Oestrich, and Klaus Heyse, Bad Soden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,711

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338054

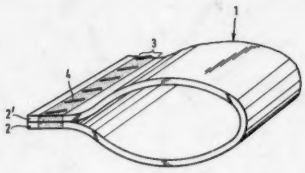
Int. Cl.[4] F16L *11/12*

U.S. Cl. 138—118.1 **14 Claims**

1. A tubular packaging casing, comprising a tubing formed from a flat film comprising cellulose hydrate by overlapping the edges of said film, said tubing including:

(a) a seam region extending along the longitudinal axis of said tubing in the area of the overlapped edges of said film, said seam region being at a distance from the film edges; and

(b) means, comprising a sewing thread, along said seam region, for bonding said overlapped edges, wherein said tubing comprises a moisture content of from about 5 to



15% by weight relative to the weight of the casing and a plasticizer content in an amount from about 5 to 20% by weight relative to the weight of the casing and an increased amount of said plasticizer in said seam region of up to about 30% by weight relative to the weight of the casing.

4,593,722

SEALANT FOR INTERNALLY SEALING PIPELINE

Mitsuo Yamamoto; Namio Kinumoto; Toshinori Tsuji, all of Osaka, and Tutomu Hiraoka, Uji, all of Japan, assignors to Osaka Gas Company, Osaka, Japan

Continuation of Ser. No. 559,843, Dec. 9, 1983, abandoned, which is a continuation of Ser. No. 416,730, Sep. 10, 1982, abandoned, which is a continuation-in-part of Ser. No. 304,439, Sep. 21, 1981, abandoned. This application Dec. 4, 1984, Ser. No. 676,619

Int. Cl.[4] F16L *9/14*

U.S. Cl. 138—145 **3 Claims**

1. A process for sealing cavities in a pipeline which comprises forming a sealant comprising

acrylic polymer particles in an emulsified and dispersed state and coagulations of weakly cohering fine particles of inorganic oxide selected from a group consisting of silica, silica-alumina and zeolite, with said inorganic oxide being contained at less than 5 percent by weight and said fine particles of inorganic oxide having diameters of about 12 millimicrons,

directing said sealant into said pipeline,

filling the pipeline with said sealant in a foamed state of an aqueous emulsion type,

delivering air under pressure into the pipeline to drain an excess amount of the sealant from the pipeline and

wherein said coagulations of inorganic oxide readily break into finer particles upon entry into said small cavities, said finer particles accumulating in said small cavities and promoting precipitation of the acrylic polymer particles thereby to effectively seal said small cavities.

4,593,723

HEALD CONTROL APPARATUS

John D. Griffith, Boldon, England, assignor to Bonas Machine Company Limited, Sunderland, England

Filed Mar. 2, 1984, Ser. No. 585,401

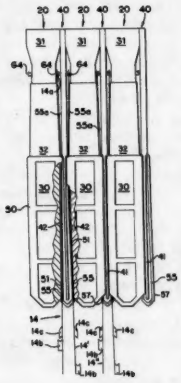
Claims priority, application United Kingdom, Mar. 11, 1983, 8306813

Int. Cl.[4] D03C *3/06, 3/20*

U.S. Cl. 139—65 **10 Claims**

1. A heald rod retention device for selectively engaging a terminal end portion of a reciprocating heald rod, the retention device having an electrically activatable magnet for laterally deflecting the terminal end portion of the rod from its path of reciprocal travel, the magnet including north and south poles located side by side and extending along the path of travel of the heald rod so as to create a magnetic flux path across the

rod, said retention device further including a first portion for guiding reciprocal movement of the heald rod along one longitudinal side thereof, a second portion possessing a hook formation for engaging the heald rod and an intermediate portion



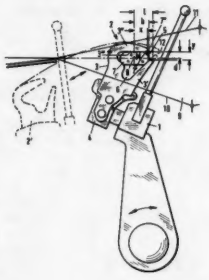
between the first and second portions, the intermediate portion including the electrically activatable magnet, the magnet when activated causing the terminal end of the heald rod to be deflected laterally to engage with the hook formation.

4,593,724

GUIDE FOR A WEFT-PICKING PROJECTILE IN A WEAVING MACHINE

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 4, 1985, Ser. No. 740,989
Int. Cl.[4] D03D *49/60*
U.S. Cl. 139—188 R **2 Claims**



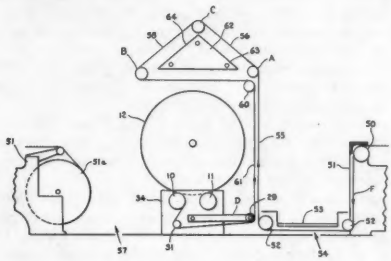
1. A guide for a weft-picking element in a weaving machine, said guide including a plurality of sequentially disposed guide teeth, each said tooth having a guide hook and a support defining a weft picking element receiving passage with a transverse exit aperture for a weft yarn, wherein a horizontal distance x between a vertical centerline of said passage and a free end of said hook is equal to or less than a half-width b of said picking element in said passage and equal to or less than a horizontal distance l between a center of said passage and a free end of said support and wherein a vertical distance y between said free end of said support and an inside horizontal edge of said hook is equal to or greater than a vertical distance d between said inside horizontal edge of said hook and a horizontal centerline of said passage.

4,593,725

CLOTH INSPECTION STAND FOR LOOM TAKEUP

William J. Alexander, III, P.O. Box 848, Mauldin, S.C. 29662

Filed Dec. 13, 1983, Ser. No. 560,983
Int. Cl.[4] D03D *49/20*
U.S. Cl. 139—304 **5 Claims**



1. For use in an off loom surface wind cloth takeup having an alley on one side of the takeup for doffing a cloth roll from the takeup and another alley on the other side of the takeup, said alleys being accessible by operators standing in each of the respective alleys, a cloth inspection stand comprising:

guide means carrying a first run of cloth in open width at a level above the takeup for inspection by an operator standing in one of said alleys;

guide means carrying a second run of cloth in open width at a level above the takeup for inspection by an operator standing in the other of said alleys; and

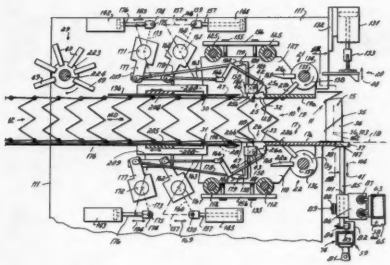
means transporting said cloth in a substantially horizontal run in open width from one of said alleys to the other of said alleys above across and out of contact with the cloth roll.

4,593,726

COIL SPRING ASSEMBLY MACHINE

Henry Zapletal, Carthage, Mo.; Horst F. Wentzek, and George M. Chembakaffery, both of Kenosha, Wis., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Division of Ser. No. 300,995, Sep. 10, 1981, Pat. No. 4,492,298. This application May 17, 1984, Ser. No. 611,209
Int. Cl.[4] B21F *35/00*
U.S. Cl. 140—89 **6 Claims**



1. A machine for transferring a group of coil springs from a first location to a second location, said machine comprising,

a frame,

a group of fingers mounted upon said frame, each finger being sized to be received within a barrel of one coil spring,

means operatively connected to said fingers for inserting

each finger into, and for retracting each finger from, said barrel of said coil spring,

means operatively connected to said fingers for moving said fingers, and therefore said springs, from said first location to said second location after said fingers have been inserted into said barrels of said springs,

a support platen mounted upon said frame, said springs being positioned on said support platen in said second location, and said springs' axes being generally normal to said support platen in said second location,

said moving means being adapted to pivot said springs through an arc of at least about 90° between said first location and said second location,

a feed conveyor located adjacent said fingers for moving said springs to said first location, said springs' axes being generally horizontal in said first location, and said support platen being generally horizontal,

a compression bar positioned adjacent said support platen in a location spaced from said support platen, said compression bar being adapted to cooperate with the top end loops of said coil springs when said coil springs are in said second location, and

means operatively connected to said compression bar for moving said compression bar in a direction generally normal to said support platen, said compression bar being movable between extended and retracted positions relative to said support platen, said compression bar being retracted as said coil springs are positioned in said second location by said group of fingers, and said compression bar being extended into contact with the top end loops of said coil springs after positioning said coil springs in said second location, the height of all said springs being sized to a predetermined desired height by said compression bar when said compression bar is in said extended position.

4,593,727

APPARATUS AND METHOD FOR CONTROLLING THE CONTENTS AND THE FILLING OF A DISTRIBUTION TANK FOR PULVERIZED MATERIALS

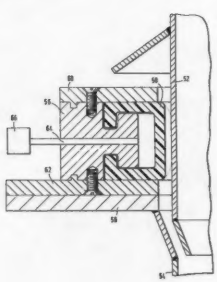
Léon Ulveling, Howald, Luxembourg, assignor to Paul Wurth S.A., Luxembourg, Luxembourg

Continuation of Ser. No. 435,311, Oct. 19, 1982, abandoned. This application Jul. 6, 1984, Ser. No. 628,237

Claims priority, application Luxembourg, Oct. 19, 1981, 83701

Int. Cl.⁴ B65G *53/00*

U.S. Cl. 141—5 **17 Claims**



1. In a system for controlling the contents and filling of a distribution tank for pulverized material, which distribution tank operates under pressure, the pressure being above atmospheric pressure, and which is connected on its downstream side to receiving apparatus for the pulverized material and on its upstream side to an intermediate pulverized material supply tank which is alternatively vented and pressurized to a level equal to or higher than the pressure in the distribution tank, the intermedite tank being selectively connected into flow communication to deliver pulverized material to the distribution tank and selectively connected out of flow communication with the distribution tank, the improvement comprising:

first weighing means for weighing the contents of the distribution tank and producing a control signal commensurate with the weight of said contents;

second weighing means for weighing the contents of the intermediate tank and producing a control signal commensurate with the weight of the intermediate tank contents, said first and second weighing means being respectively indpendent of each other;

valve means for controlling the flow of pulverized material from said intermediate tank to said distribution tank in accordance with said signals;

expandable seal means between said intermediate tank and said distribution tank, said seal means having a first mode in which fluid tight connection is effected between said intermediate tank and said distribution tank and having a second mode in which said intermediate tank and said distribution tank are substantially isolated from each other for weighing purposes; and

first connector means extending from said itnermediate tank and second connector means extending from said distribution tank, said first and second connector means forming a flow path between said tanks;

said expandable seal means being mounted on one of said connector means and being selectively movable into and out of engagement with the other of said connector means.

4,593,728

DISPENSING DEVICE AND RECORDING APPARATUS

Thomas P. Whitehead, 70 Northumberland Road, Leamington Spa, Warwickshire; Gary H. G. H. Thorpe, 84 Newcombe Road, Handsworth, Birmingham; Larry J. Kricka, 16 Newent Road, Northfield, Birmingham; John E. C. Gibbons, 9 Norfolk Close, Stirchley, Birmingham, and Roger A. Bunce, 117 Berberry Close, Bournville, Birmingham, all of England

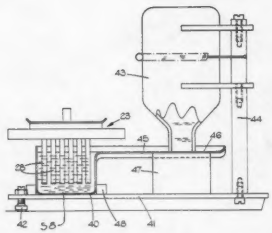
PCT No. PCT/GB83/00287, § 371 Date Jun. 27, 1984, § 102(e) Date Jun. 27, 1984, PCT Pub. No. WO84/02090, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 14, 1983, Ser. No. 626,856

Claims priority, application United Kingdom, Nov. 20, 1982, 8233168; Apr. 26, 1983, 8311372

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—98 **32 Claims**



1. A dispensing device comprising:

a tube support member;

a plurality of vertically extending tubes supported at the upper ends thereof in said support member in spaced array, said tubes being open at both ends;

a common chamber in said support member communicating with the open upper ends of said tubes; and

a sealable opening through said support member communicating said chamber with the atmosphere so that said tubes are simultaneously filled with fluid a predetermined amount by immersing the lower ends thereof to a predetermined depth in a body of fluid with said sealable open-

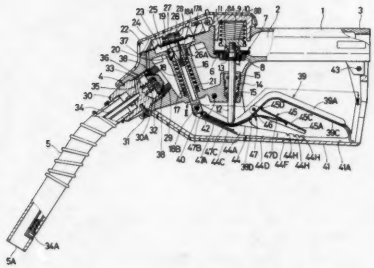
ing unsealed and thereafter sealing said opening to retain said fluid in said tubes when said tubes are removed from the body of fluid and unsealing said opening to dispense the fluid retained in said tubes therefrom.

4,593,729

FUEL DISPENSING NOZZLE WITH AUTOMATIC SHUT-OFF VALVE

Shigenori Tamra, 4-2, Mukougaoka 2-chome, Bunkyo-ku, Tokyo, 113, Japan

Filed Oct. 19, 1984, Ser. No. 662,620
Claims priority, application Japan, Apr. 11, 1984, 59-72287
Int. Cl.[4] B65B *3/18*
U.S. Cl. 141—218 **6 Claims**



1. An automatic shut-off type fuel dispensing nozzle, comprising in combination:

a nozzle body internally defining a fuel passage and having a spout tube at the outlet of said fuel passage;

a valve body liftably seated on a valve seat formed in said nozzle body for opening and closing said fuel passage;

a valve spring for urging said valve body toward a valve closing direction;

a valve stem having a first end thereof secured to said valve body and a second end protruded out of said nozzle body;

a plunger slidably received in said nozzle body;

a partition member and measn for moving said partition member in a predetermined direction when a fuel supplied from said spout tube reaches a predetermined liquid level;

an engaging means for engaging a first end of said plunger with said partition member, for holding said plunger in a first position until said predetermined liquid level is reached, and for releasing said plunger upon movement of said partition member to permit said plunger to slide into a second position;

an operating lever having a first end thereof pivotally supported on a second end of said plunger, being abutted against said second end of said valve stem in an intermediate portion of said operating lever, and forming a handle at a second end thereof;

a lever guard provided on said nozzle body in a manner to underlie said operating lever;

a slide rack having a first end thereof pivotally connected to said second end of said plunger, a second end of said slide rack comprising a rack portion slidably supported on an inner surface of said lever guard; and

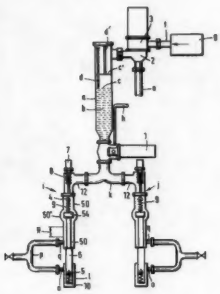
a trigger pivotally supported on said intermediate portion of said operating lever and comprising means for releasably engaging said rack portion of said slide rack.

4,593,730

LIQUID DISPENSING APPARATUS

Wilhelm Reil, Bensheim, and Ulrich Deutschbein, Muhltal, both of Fed. Rep. of Germany, assignors to Tetra Pak Development, Pully, Switzerland

Filed Jul. 13, 1984, Ser. No. 630,650
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325747
Int. Cl.[4] B65B *3/12*
U.S. Cl. 141—258 **8 Claims**



1. An apparatus for introducing a controllable amount of a liquid substance into a packaging means, comprising:

(a) a hollow annular pump piston movably disposed within a cylinder;

(b) a hollow piston rod attached to said pump piston being only partially disposed at its upper end in said cylinder;

(c) a feed end disposed at the top of said cylinder having a feed valve;

(d) a discharge end disposed at the bottom of said piston rod, remote from said pump piston and said feed end, having a discharge member and a discharge valve and characterized in that said discharge end dips at least partially into an open packaging means;

(e) drive means for moving said piston rod and said pump piston within said cylinder having at least two rotationally mounted levers which are in adjustable driving engagement with each other, and characterized in that at least one of said levers is capable of engagement with a cam member, and coupling means for connecting said piston rod to at least one of said levers.

4,593,731

DRIVING MEANS FOR ROTATING SPINDLES FOR USE IN A WOOD WORKING ROUTER OR THE LIKE

Takeshi Tanaka, Shizuoka, Japan, assignor to Shinko Machinery Works, Inc., Shizuoka, Japan

Filed Aug. 15, 1984, Ser. No. 641,024
Claims priority, application Japan, Sep. 28, 1983, 58-181487
Int. Cl.[4] B27F *5/02*; B27C *9/04*
U.S. Cl. 144—1 A **10 Claims**

1. A driving apparatus for rotating spindles in a wood working router machine comprising:

a machine base;

a support column extending from said base having a front side;

a turret head movably mounted on the front side of said column;

a plurality of spindle heads mounted in radial orientation on said turret head;

a spindle having a working end rotatably mounted in each spindle head;

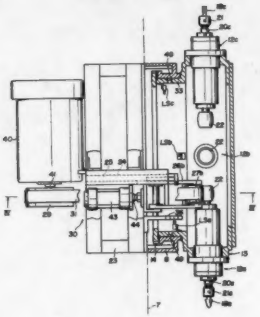
cutting tools respectively mounted at said working end of each of said spindles;

turret head positioning means for moving said turret head to

position a selected one of the cutting tools into a processing position for performing a cutting operation;

an electric motor mounted within said column; and

transmission means for transmitting rotary movement of said electric motor to a spindle in the processing position, said transmission means comprising a driving pulley mounted on said electric motor to be driven thereby, at least one pair of spaced idler pulleys mounted on said column, a



drive belt operatively engaging said driving and idler pulleys, a passive pulley mounted on each spindle within said turret head, and an actuating means movably mounted on said column for engaging and disengaging said drive belt with the passive pulley on the spindle in the processing position by moving said idler pulleys toward and retracting them from, respectively, the passive pulley in the processing position.

4,593,732

METHOD AND INSTALLATION FOR PROCESSING TREES IN A TERMINAL LANDING

Sven O. Ericsson, Fjugesta, Sweden, assignor to S O Eriksson Maskin AB, Fjugesta, Sweden

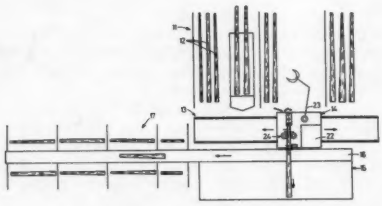
PCT No. PCT/SE83/00345, § 371 Date May 29, 1984, § 102(e) Date May 29, 1984, PCT Pub. No. WO84/01321, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 30, 1983, Ser. No. 616,219

Claims priority, application Sweden, Sep. 30, 1982, 8205593

Int. Cl.⁴ B27L *1/00*

U.S. Cl. 144—2 Z **7 Claims**



1. An installation for processing trees in a terminal landing, comprising a processing unit movable on a horizontal track and including a loading crane for picking trees from a storage adjacent the track, a processing assembly on said processing unit having a feeder for receiving the butt end of trees supplied by means of the loading crane and for advancing the trees lengthwise toward a cutter on said processing assembly for cutting the trees to logs with the trees cantilevered between the butt end and the cutting site, a log-received bed positioned beneath the processing assembly at the discharge side of said cutter and forming an inclined plane, said log-receiving bed having at its lower side a horizontal conveyor running parallel with the track of said processing unit, and a transverse conveyor mounted adjacent to, and slightly higher than, said feeder for temporarily supporting the butt end of a tree to be processed, said transverse conveyor being adapted to move the butt end of the tree to a position for reception thereof by said feeder.

4,593,733

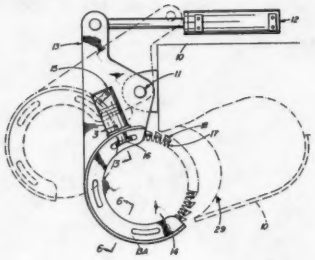
TREE FELLING HEAD HAVING A RIM DRIVEN ROTARY CUTTER

Douglas D. Hamilton, Montreal, Canada, assignor to Logging Development Corporation, Montreal, Canada

Filed Apr. 30, 1984, Ser. No. 605,219

Int. Cl.⁴ A01G *23/08*; B27B *5/14*

U.S. Cl. 144—34 R **18 Claims**



1. A felling head comprising in combination:

(a) a frame having a grapple mounted thereon and comprising a pair of jaw members, at least one of which is pivotally mounted on the frame for movement toward and away from the other and together providing a grapple jaw which may be selectively opened and closed to respectively receive and grasp a standing tree, power means connected to said movable grapple jaw members selectively to open and close said grapple; and

(b) a severing device mounted on said frame below said grapple for severing a standing tree, said severing device comprising an anvil mounted on said frame, an arm pivotally mounted on said frame and having an arcuate portion facing the anvil and including bearing means for supporting a circular saw, a rim driven planar circular saw mounted around a peripheral portion thereof on the arcuate portion of said arm, movement of said arm during pivoting being in a plane transverse to the length of the standing tree, said rim driven saw having cutting formations around the outer periphery thereof projecting in a direction outwardly from the axis of rotation of the saw and having a portion thereof defining teeth for meshing with teeth on a power driven pinion; a motor unit mounted on said arm and having a pinion mounted directly thereon, the teeth of said pinion meshing with the teeth on the circular saw for driving the same, said pinion being a Spur Gear.

4,593,734

FRAME ROUTING APPARATUS

Robert S. Wallace, Los Angeles, Calif., assignor to M. Bosley Wright, Owings Mills, Md.

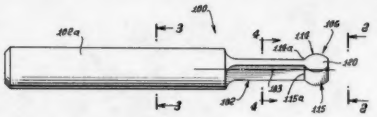
Continuation-in-part of Ser. No. 535,784, Sep. 26, 1983, Pat. No. 4,493,583. This application Sep. 4, 1984, Ser. No. 646,440

Int. Cl.⁴ B26D *1/12*

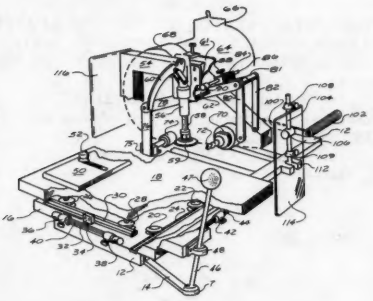
U.S. Cl. 144—136 R **9 Claims**

1. In a router for cutting an L-shaped groove in elongated frame members adapted to have their ends joined in L-shaped assembly by an L-shaped bracket,

(a) an elongated cutter stem having an axis about which the stem is rotatable, the stem having substantially parallelogram cross sections in planes normal to said axis, and
(b) a cutter head at the end of the stem and integral therewith, the head also having substantially parallelogram cross sections in planes normal to said axis,
(c) said head forming generally outwardly convex outer surfaces and opposite flat sides intersecting said curved outer surfaces.

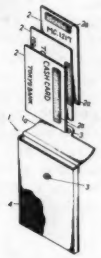


4,593,735
BORING, MORTISING, TENONING AND DUPLICATING WOODWORKING TOOL
John C. J. Wirth, Jr., 5604 Alameda NE., Albuquerque, N. Mex. 87111
Filed Mar. 23, 1983, Ser. No. 477,881
Int. Cl.[4] B27M *3/00*
U.S. Cl. 144—144 R **12 Claims**



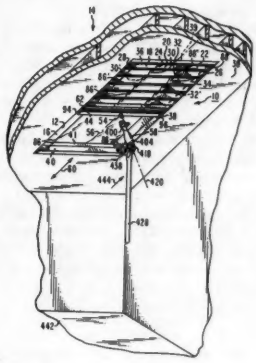
10. A machine tool for use in reproducing a three-dimensional object comprising in combination:
(a) a base,
(b) a frame sidably mounted on said base for motion in a first horizontal plane,
(c) a platform sidably mounted on said frame for motion at a right angle to said frame in a second horizontal plane,
(d) a series wound motor having a router bit secured to its output shaft,
(e) means to support said motor for motion in a vertical plane,
(f) a bracket secured to said platform having means to secure a three-dimensional object to one side thereof and means on the other side to secure a workpiece to said platform,
(g) a first arm connected at one end to said motor supporting means,
(h) a second arm pivotally connected to the other end of said first arm,
(i) a third arm pivotally connected between the said second arm and the said motor supporting means, said first, second, third arms and said motor supporting means forming a parallelogram, and,
(j) a tracing element secured to said second arm in the same vertical plane as the said router bit.

4,593,736
CASE OR BAG COVERED WITH A MAGNET SHIELDING MATERIAL
Tamao Morita, Tokyo, Japan
Filed Jan. 9, 1985, Ser. No. 689,975
Int. Cl.[4] B65B *11/00*
U.S. Cl. 150—147 **12 Claims**



1. A protective card holder for encasing a card having a magnetic record stored thereon or therein comprising:
a non-magnetic first liner in the shape of an envelope having a pocket therein for moveably receiving the card to completely enclose at least that part of the card containing the stored magnetic record; and
a second liner of magnetic shielding material completely surrounding said pocket in substantially overlying relationship so that said second liner shields the stored magnetic record from magnetic force external to said liners.

4,593,737
BLIND STRUCTURE INCLUDING REMOTE SLAT MOVING MEANS
Ralph Clemente, Maywood, N.J., assignor to RCA Corporation, Princeton, N.J.
Filed Dec. 19, 1983, Ser. No. 562,531
Int. Cl.[4] E06B *9/262, 9/327*
U.S. Cl. 160—84 R **3 Claims**



1. In a blind structure comprising:
a first fixed sill member;
a movable sill member rectangular in transverse section;
a second fixed sill member; and
a slat structure between and coupled to said first sill and said movable sill member, said blind structure further including friction means for retaining said movable sill member in any given orientation between said first and second sill

members, and force directing means centrally coupled to said lower movable sill member for locating a force to be applied to said movable sill member to displace said movable sill member parallel to said first and second sill members, the improvement therewith comprising:

remote slat moving means including a channel-like element having a base wall and two parallel side walls, the channel of said element being sized to closely receive said movable sill member in a sill moving position from a remote location so that there is negligible space and play therebetween, said base wall including means for mating with said force directing means and for remotely releasably locking the channel-like element to the movable sill member when engaged for displacing said movable sill member whereby there is negligible motion of the slat moving means relative to the engaged sill member when the remote force set forth below is transferred; and

link means connected to at least one of said walls for transferring a remote force applied to said link means to said movable sill member via said engaged slat moving means.

4,593,738

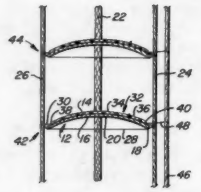
VENETIAN BLIND

Simon S. Chi Yu, 4090 Whittle Ave., Oakland, Calif. 94602

Filed Jan. 25, 1985, Ser. No. 695,065

Int. Cl.[4] E06B *9/00*

U.S. Cl. 160—176 R **11 Claims**



1. A venetian blind comprising:

a. a first elongated slat, said first slat including a top, bottom, and an edge portion therebetween, said first slat further including first and second end portions extending along said elongation of said first slat;

b. first and second lines, said first line being linked to said first end portion of said first slat, said second line being linked to said second end portion of said first slat, said first and second lines supporting said first slat such that movement of said first and second lines in opposite directions tilts said first slat;

c. a second elongated slat said second slat including a top, bottom and an edge portion therebetween, said second slat further including first and second portions extending along said elongation of said second slat;

d. a third line, said third line being linked to said first end portion of said second slat, said second slat resting on said top of said first slat such that lifting of said first end portion of said second slat moves said second end portion of said second slat along said top of said first slat.

4,593,739

METHOD OF AND APPARATUS FOR PACKING SAND AROUND A MOLD PATTERN BY VIBRATION

Russell J. VanRens, West Allis, and Frank V. Bailey, Racine, both of Wis., assignors to Outboard Marine Corporation, Waukegen, Ill.

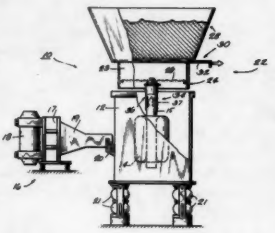
Filed Dec. 30, 1983, Ser. No. 567,330

Int. Cl.[4] B22C *5/12, 9/04, 15/10*

U.S. Cl. 164—34 **16 Claims**

1. A process for inserting a mold pattern into sand for casting, said process comprising the steps of holding a mold pattern in a mold flask in unconnected relation to the mold flask, depositing sand into the mold flask to surround the mold pattern, and shaking the mold flask to compact the sand around the mold pattern while the sand is being deposited into the mold flask.

7. A molding apparatus comprising a mold flask adapted to



contain a mold pattern and sand, means independent of said mold flask for holding a mold pattern in position in said mold flask, means for depositing sand into said mold flask to surround the mold pattern, and means for shaking said mold flask to compact the sand around the mold pattern while the sand is being deposited into said mold flask.

4,593,740

METHOD AND APPARATUS FOR FREEING A PATTERN OR SHAPING ELEMENT FROM FOUNDRY MATERIAL

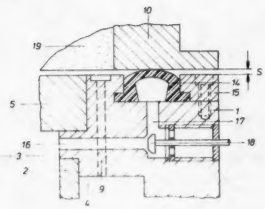
Eugen Bühler, Schleifweg 3, 8877 Burtenbach, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,297

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304148

Int. Cl.[4] B22C *9/00, 17/00*

U.S. Cl. 164—44 **17 Claims**



1. A method of freeing a pattern or shaping element from a mass of foundry material, that has been compacted against said element, using gas pressure, said element and said material being within a gas-tight enclosure made up of at least two parts that are able to be moved in relation to each other with a sealed connection therebetween while keeping up said gas pressure, comprising the steps of:

forcing compressed gas into position between said element and said material so that the two are separated along an interface therebetween,

further supplying said gas to said interface so that a gap is formed between the said element and the said foundry material, simultaneous with the step of further supplying said gas to said interface, moving the two parts of said enclosure away from each other to let said gap be formed,

then shutting off gas supply to said enclosure,

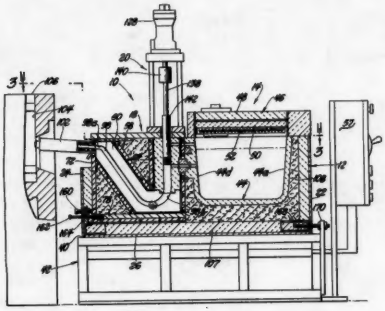
then unsealing said connection of said enclosure and moving said element clear of said compacted foundry material.

4,593,741

DIE CASTING APPARATUS

William C. Caugherty, 4 Edgewater Sq., Lakewood, Ohio 44107

Filed Apr. 10, 1984, Ser. No. 598,721
Int. Cl.[4] B22D *39/00*
U.S. Cl. 164—337 9 Claims



1. A die casting apparatus for delivering molten metal to a nozzle communicating with an inlet of a mold, said apparatus comprising:

(a) a housing;

(b) a furnace assembly positioned in said housing adjacent one end thereof and including a crucible for holding molten metal to be cast having an outboard end wall disposed adjacent one end wall of said housing;

(c) a gooseneck assembly positioned in said housing adjacent the other end thereof and defining a gooseneck passage opening at its upper outlet end adjacent another end wall of said housing opposite said one end wall for communication with the nozzle and opening upwardly at its lower inlet end at an intermediate location in said housing;

(d) a shot barrel positioned in said housing in a generally vertical position intermediate said furnace assembly and said gooseneck assembly with a side wall of the barrel disposed adjacent the inboard end wall of said crucible and the vertical bore of the barrel communicating at its lower end with the upwardly opening inlet end of said gooseneck passage; and

(e) a passage extending through said crucible inboard side wall and through said shot barrel side wall to provide molten metal communication between said crucible and said vertical bore of said shot chamber;

(f) said gooseneck assembly comprising

(1) a multi-piece holder,

(2) means releasably joining the pieces of said holder together to define an elongated, inclined gooseneck chamber, and

(3) refractory insert means removably positioned within said gooseneck chamber and having a central elongated passage constituting said gooseneck passage;

(g) said refractory insert means comprising two insert halves having a parting line extending the length of said refractory insert means passing through said gooseneck passage; and

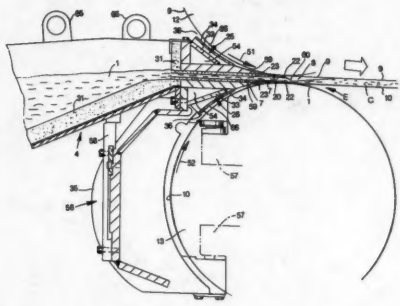
(h) compressible means compressed between the joined pieces of said holder and said insert halves for accomodating the difference in thermal expansion between said holder pieces and said insert halves.

4,593,742

APPARATUS FOR FEEDING AND CONTINUOUSLY CASTING MOLTEN METAL WITH INERT GAS APPLIED TO THE MOVING MOLD SURFACES AND TO THE ENTERING METAL

Robert W. Hazelett; Charles J. Petry, both of Colchester, and Stanley W. Platek, Essex Junction, all of Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Division of Ser. No. 372,459, Apr. 28, 1982, abandoned. This application Jul. 17, 1984, Ser. No. 631,595
Int. Cl.[4] B22D *11/06, 11/00*
U.S. Cl. 164—415 20 Claims



1. Apparatus for continuously casting metal product directly from molten metal, wherein the molten metal is introduced into the entrance to a moving mold whose downstream direction is approximately horizontal or downwardly inclined at an angle less than 45° with respect to the horizontal, said moving mold being defined between first and second opposed moving surfaces, wherein said first and second moving surfaces approach the entrance to the moving mold and then move in the downstream direction from the entrance to the outlet of the moving mold and then exit from the outlet of the moving mold, and wherein the product exits from the outlet of the moving mold, said apparatus comprising:

a metal-feeding nosepiece positioned in the entrance to said moving mold with respective clearance gaps of less than 0.050 of an inch (1.27 mm) between said nosepiece and said first and second moving surfaces, said clearance gaps being at least 0.010 of an inch (0.25 mm),

said nosepiece having at least one metal-feeding passage extending downstream therein and having means associated therewith for feeding the molten metal through said metal-feeding passage into the entrance to said moving mold,

said nosepiece also having at least one gas-feeding passage extending downstream in said nosepiece,

gas-feeding means for feeding an inert gas through said gas-feeding passage at a pressure slightly exceeding atmospheric pressure directly into the entrance to said moving mold, said inert gas being inert and essentially non-reactive in relation to the metal being cast,

first and second shield members respectively positioned in close proximity to said first and second moving surfaces where they are approaching the entrance to the moving mold for defining first and second narrow gas-flow channels adjacent to the respective moving surfaces,

said first narrow gas-flow channel being located between said first shield member and said first moving surface,

said second narrow gas-flow channel being located between said second shield member and said second moving surface, and

the downstream portion of each shield member being positioned near to the respective clearance gap for causing inert gas exiting from the entrance to the moving mold through the respective clearance gap to flow upstream

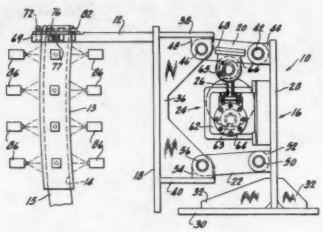
through said first and second narrow channels counter to the direction of movement of the respective adjacent first and second moving surface for cleansing and displacing atmospheric gases off from the respective moving surface before it enters the moving mold.

4,593,743

CONTINUOUS CASTING APPARATUS HAVING OSCILLATOR FOR MOLD TUBE

James D. McVay, Youngwood, and Hermann Take, Pittsburgh, both of Pa., assignors to Continuous Casting Systems Inc., Pittsburgh, Pa.

Filed May 9, 1985, Ser. No. 732,460
Int. Cl.[4] B22D *11/04, 11/124, 27/08*
U.S. Cl. 164—416 **6 Claims**



1. A continuous casting apparatus comprising:
a mold tube having a vertically oriented arcuate mold passage,
a mold tube mounting plate, said mold tube being mounted at one end of said mold tube mounting plate,
a fixed support having upper and lower portions,
support frame means spaced horizontally from the fixed support and having upper and lower portions, and first and second sides, said mold tube mounting plate being fixed to the first side of said support frame means,
first linkage means pivotally connected to the upper portions of the fixed support and the support frame means and second linkage means pivotally connected to the lower portions of the fixed support and the support frame means, the first and second linkage means being connected to the second side of said support frame means,
an eccentric drive means disposed between said first and second linkage means and coupled to said first linkage means for oscillating said mold tube in an arcuate path defined by the mold passage.

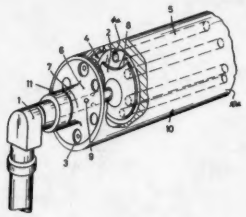
4,593,744

SUPPORT ROLL IN A MACHINE FOR CONTINUOUS CASTING

Hans G. Lewin, Ratingen, and Lothar Finck, Duisburg, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 602,943
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315376
Int. Cl.[4] B22D *11/128*
U.S. Cl. 164—448 **4 Claims**

1. In a roll for continuous casting having a plurality of axially extending and parallely oriented, surface-near cooling ducts, the roll further having journal pins through which cooling coolant feeding and discharge is provided, there being a cylindrical manifold coolant distribution chamber near one axial end of the roll and having a base surface from which said cooling ducts extend, there being duct entrances accordingly; the improvement comprising:
a stationary cover element positioned in said manifold chamber constructed to permit unrestricted access to at least one of said cooling duct entrances while partially or completely covering other entrances; and
said journal pin being hollow, there being a rod-like stationarily mounted carrier traversing said hollow pin and extending into the manifold chamber, the carrier carrying at one end said cover element, said roll rotating relative to said cover element to obtain thereby progressively the unrestricted access to all of the cooling duct entrances and on a cyclic basis as the roll rotates.

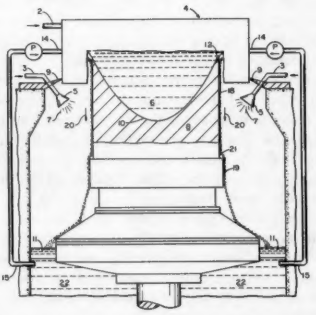


4,593,745

FIRE RETARDANT CONTINUOUS CASTING PROCESS

Ho Yu; John E. Jacoby, both of Murrysville, and Robert A. Ramser, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 550,466, Nov. 10, 1983. This application Oct. 9, 1984, Ser. No. 658,652
Int. Cl.[4] B22D *11/124*
U.S. Cl. 164—487 **20 Claims**



1. A method of continuously casting a lithium-containing alloy comprising:
cooling a lithium-containing alloy sufficiently to form a continuous ingot having a substantially solid shell;
cooling said ingot by direct chill with an organic coolant; and
inhibiting fire by adding non-aqueous fire retardant liquid to said coolant.

4,593,746

METHOD AND APPARATUS FOR PRODUCING SOUND CASTINGS

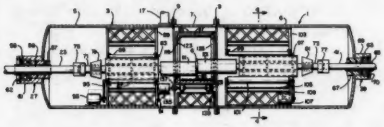
Falih Darmara, Apt. 1 - Bloc C, Parc Guillemo, Andorra La Vella Principat d'Andorra, France

Filed Apr. 10, 1984, Ser. No. 598,695
Int. Cl.[4] B22D *27/02*
U.S. Cl. 164—495 **10 Claims**

1. A method of producing large sound metal castings by striking an electrical arc in a gap defined by adjacent end faces of opposed large elongate electrodes, each of which is

mounted for rotation about a longitudinal axis and subject to wobble, with at least one electrode being made of the metal to be cast and consumable by the heat of the arc to produce molten metal droplets which fall by gravity into a mold spaced from the gap to form the casting, the improvement comprising:

A. mounting the electrodes with their longitudinal axes



parallel and sufficiently offset with respect to each other for realizing substantially complete overlapping of the adjacent end faces during rotation of the electrodes to compensate for electrode wobble and cause uniform depletion of the at least one consumble electrode; and

B. maintaining the metal droplets in substantially fully molten condition until they have been cast into the mold.

4,593,747

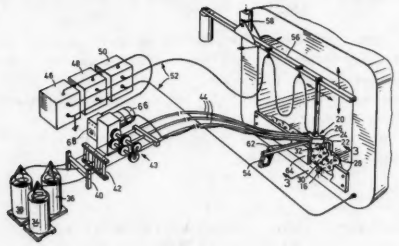
INGOT MOULD REPAIR METHOD

Edward Kelly, Guelph; Frederick T. Bishop, Burlington, and Donald J. Reilly, Guelph, all of Canada, assignors to Recastco Inc., Burlington, Canada

Filed Nov. 30, 1983, Ser. No. 556,374

Int. Cl.[4] B22D *27/02*

U.S. Cl. 164—496 **2 Claims**



1. A method of rebuilding a grey cast iron ingot mould having a cavity eroded in the graphitic cast iron therefor by filling the whole cavity with substantially graphitic cast iron comprising the steps of:

(i) filling the whole cavity from a manually held welding head with iron from more than one continuous tubular welding wire supply by electric arc deposit; and

(ii) simultaneously supply heat to the mould and cast iron deposit from the arc of the arc-deposit of cast iron at a current density and a deposition rate to burn off contamination on the cavity wall, to fuse the deposit to the mould and to heat the cast iron pool created by the arc deposit to an extent that provides a cooling time long enough to permit substantial amounts of the carbon therein to precipitate out as graphite whereby on cooling the cavity is filled with substantially graphitic cast iron.

4,593,748

PROCESS FOR THE CLEANING OF HEAT EXCHANGERS FOR EXHAUST GASES FROM ENGINES

Jan Kramb, Simmern, Fed. Rep. of Germany, assignor to Kramb Mothermik KG, Simmern, Fed. Rep. of Germany

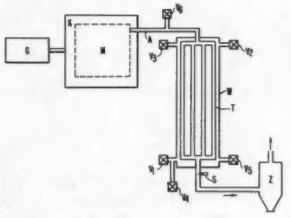
PCT No. PCT/EP83/00309, § 371 Date Jul. 16, 1984, § 102(e) Date Jul. 16, 1984, PCT Pub. No. WO84/02181, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 18, 1983, Ser. No. 633,183

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1982, 3243114; Jul. 18, 1983, 3325872

Int. Cl.[4] F28G *13/00*

U.S. Cl. 165—1 **17 Claims**



1. In a process comprising cooling the exhaust gases from an internal combustion engine of a stationary installation by use of a heat exchanger having conudit walls, wherein said exhaust gases are passed in direct contact with a first surface of each said wall and a heat transfer medium is circulated past the opposite second surface of each said wall in direct contact therewith, thereby transferrring heat from said exhaust gases through said walls to said heat transfer medium, the improvement comprising removing from said first surfaces of said conduit walls sediment and condensate deposited thereon from said exhaust gases, said removing comprising:

interrupting said circulation of said heat transfer medium in direct contact with said second surfaces of said conduit walls, such that said transfer of heat from said exhaust gases to said heat transfer medium is interrupted; and

thereby transferring said heat from said exhaust gases to said conduit walls and thus heating said conduit walls to a temperature sufficient to burn said sediment and condensate from said first surfaces;

4,593,749

PROCESS FOR INCREASING THE HEAT FLOW DENSITY OF HEAT EXCHANGERS WORKING WITH AT LEAST ONE HIGH-VELOCITY GASEOUS MEDIUM, AND A HEAT EXCHANGER APPARATUS FOR UNDERTAKING THE PROCESS

Oskar Schatz, Tellhöhe 14, D-8031 Stockdorf, Fed. Rep. of Germany

PCT No. PCT/DE82/00020, § 371 Date Sep. 29, 1982, § 102(e) Date Sep. 29, 1982, PCT Pub. No. WO82/02740, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 1, 1982, Ser. No. 432,908

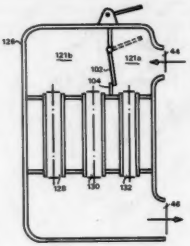
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1981, 3103199

Int. Cl.[4] F28F *13/06*

U.S. Cl. 165—1 **19 Claims**

1. A method for transferring heat from a gaseous fluid to a first fluid in a fluid flow system including at least a first fluid in a first flow path, and a second fluid in a second flow path, at least said second fluid being a gaseous fluid, comprising the steps of providing a heat transfer means fior transferring heat from the gaseous fluid to the first fluid, providing a pressure build-up means, increasing the pressure of the gaseous fluid using said pressure build-up means in order to increase the heat

flow density thereof, thereby increasing the amount of heat transferred to the first fluid as said pressure is increased, and

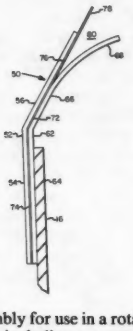


selectively placing said pressure build-up means into or out of operation.

4,593,750
RADIAL SEAL ASSEMBLY FOR ROTARY REGENERATIVE HEAT EXCHANGER

Harlan E. Finnemore, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Aug. 19, 1985, Ser. No. 767,010
Int. Cl.[4] F28D *19/00*
U.S. Cl. 165—9 **4 Claims**



1. A radial seal assembly for use in a rotary regenerative heat exchanger of the type including a rotor having a cylindrical rotor shell mounted concentrically about and joined to a central rotor post adapted for rotationg about its axis by a plurality of circumferentially spaced radially extending partitions so as to divide the rotor into a plurality of sector-shaped compartments adapted to carry a mass of heat absorbent material, and a cylindrical housing surrounding the rotor provided at opposite ends thereof with end plates having flow impervious portions located between circumferentially spaced apertures that provide inlet and outlet openings through which a flow of heating fluid and a flow of fluid to be heated pass into or out of the heat absorbent material carried by the rotor, said radial seal assembly comprising:

a. a rigid forward support leaf having a base portion and an extended portion extending outwardly therefrom;

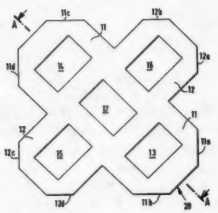
b. a rigid back support leaf having a base portion disposed substantially co-lateral with and in closely spaced relationship to the base portion of the forward support leaf and an extended portion extending outwardly therefrom, the extended portion having an outward portion directed away from the extended portion of the forward support leaf to provide a gap therebetween; and

c. at least one flexible sealing strip made of flow impervious resilient material having a base portion fixedly sandwiched between the portions of the forward support leaf and the back support leaf and an extended portion extending outwardly from its base portion between the extended portions of the forward support leaf and the back support leaf into the gap therebetween with a tip portion of the extended portion of the sealing strip extending outwardly beyond the extended portion of the forward support leaf, said radial assembly adapted to be mounted along its base portion to a radially extending partition of the rotor such that the tip portion of the sealing strip confronts the flow impervious portions of the end plates whereby a sealing relationship is established across the space between the end edge of the radially extending partition and the end plates.

4,593,751
CHEQUER-BRICK FOR VERTICAL COWPERS AND COWPER CHEQUERWORK CONSTRUCTED FROM THESE CHEQUER-BRICKS

Pan Chunshan, Shijingshan, China, assignor to China Metallurgical Imp. & Exp. Corp., China and Paul Wurth S.A., Luxembourg

Filed Oct. 2, 1984, Ser. No. 657,027
Claims priority, application Luxembourg, Oct. 5, 1983, 85028
Int. Cl.[4] F28D *17/02*
U.S. Cl. 165—9.1 **33 Claims**



1. Chequer-brick for use in conjunction with the chequerwork of vertical cowpers wherein each of said chequer-bricks comprise:

brick means, said brick means having mutually parallel top and bottom surfaces, said brick means including two cross-members defining a cruciform shape;

said cross-members being of about equal length and having different widths; and

a plurality of conduits in said cross-members connecting said top and bottom surfaces.

4,593,752
COMBINED REFRIGERATED AND HEATED FOOD SERVICE TABLE

Larry J. Tipton, Florissant, Mo., assignor to Hussmann Corporation, Bridgeton, Mo.

Filed Aug. 10, 1984, Ser. No. 639,508
Int. Cl.[4] F25B *29/00, 43/00;* **B60H** *1/32*
U.S. Cl. 165—48.1 **17 Claims**

1. A combination heated and refrigerated food service unit comprising:

(a) a heat exchange food support means which is conductive of both heat and cold for supporting food to be either heated or cooled;

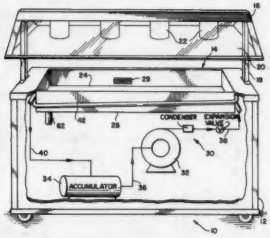
(b) mounting means for said heat exchange support means,

(c) refrigerant containing refrigeration circuit means having cooling coils mounted on said mounting means in direct heat exchange relationship with said food support means in a manner for cooling substantially the entire heat exchange food support means to thereby cool all food supported thereby,

(d) heating means mounted on said mounting means in direct

heat exchange relationship with said food support means in a manner for heating substantially the entire heat exchange food support means to thereby heat all food supported thereby to a hot food serving temperature,

(e) control means connected to said refrigeration and heating circuit means to institute either the heating or cooling of said heat exchange food support means, and



(f) accumulator means of a refrigerant capacity substantially equal to that of the refrigeration circuit means and situated at a low point of said refrigeration circuit means for thermal isolating the refrigerant in the said refrigeration circuit means from the heating effect of said heating means when said refrigeration circuit means is deactivated by emptying said cooling coils.

4,593,753

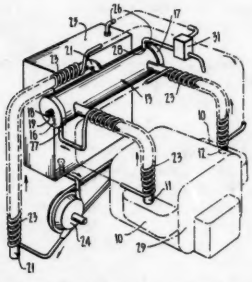
EXHAUST GAS LIQUID HEATING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Peter J. McConnell, Mount Waverley, Australia, assignor to McConnell Research Enterprises Pty. Ltd., Victoria, Australia

Filed Nov. 9, 1984, Ser. No. 669,894

Int. Cl.[4] F01N *5/02;* **F02G** *5/00;* **B05B** *1/24;* **F28D** *7/10*

U.S. Cl. 165—51 **7 Claims**



1. An exhaust gas liquid heating system for a two cylinder internal combustion engine, said system comprising a main heat exchanger spaced from an engine exhaust manifold and connected thereto by a pair of primary exhaust pipes which extend, in use, between exhaust ports of the engine and said main heat exchanger, said main heat exchanger comprising; inner and outer tubes forming a liquid jacket therebetween, inlet means whereby said primary exhaust pipes are respectively connected to communicate with the bore of said inner tube adjacent opposite ends thereof, outlet means whereby a secondary exhaust pipe is connected to communicate with the bore of said inner tube between the ends thereof and at a point substantially mid-way between said inlet means, and end caps forming a fluid seal over the ends of said tubes; and a serial liquid circuit including a holding tank, a pump for pumping liquid from said tank through a series of heat conducting coils wound around said primary and secondary exhaust pipes and in contact therewith, a liquid inlet on said main heat exchanger for providing communication between an end of said coils and said liquid jacket, and a liquid outlet on said main heat exchanger for providing communication between said liquid jacket and a tube extending to said holding tank, said liquid inlet and outlet being spaced apart along a portion of the length of said main heat exchanger being a similar portion over which said inlet and outlet means are spaced whereby exhaust gases passing along said inner tube between said inlet means and outlet means causes heat to be supplied to liquid passing along said liquid jacket between said liquid inlet and liquid outlet.

4,593,754

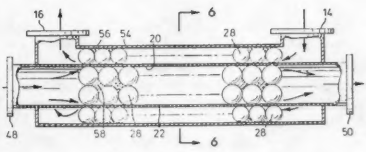
SHELL AND TUBE HEAT TRANSFER APPARATUS AND PROCESS THEREFOR

Richard A. Holl, 25672 Taladro Cir. B,, Mission Viejo, Calif. 92691

Continuation of Ser. No. 686,630, Dec. 31, 1984, abandoned, which is a continuation of Ser. No. 539,198, Oct. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 282,467, Jul. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 162,414, May 24, 1980, abandoned. This application Aug. 21, 1985, Ser. No. 767,254

Int. Cl.[4] F28F *9/24, 13/02, 13/08*

U.S. Cl. 165—109.1 **12 Claims**



1. Shell and tube heat exchange apparatus for heat exchange between two fluids comprising:

a shell having an inner wall, an inlet to the interior thereof and an outlet therefrom for the passage of a respective fluid through the shell space in the shell interior;

at least one tube mounted within the shell having an inner and an outer surface and having an inlet to the interior thereof and an outlet therefrom for the passage through the tube interior of a respective fluid, each tube wall constituting a heat exchange wall between the two fluids in the shell interior and the tube interior;

fluid flow within the tube interior taking the form of a non-turbulent boundary layer immediately adjacent to the tube inner surface, and a core-layer interfacing with the boundary-layer;

a tube-side fluid flow interrupter structure within each tube comprising a plurality of longitudinally extending rows of spheroidal members contacting the inner wall of the passage, the structure interrupting non-turbulently the full development of at least the boundary-layer at the tube inner surface at a plurality of spaced interruption spots, whereby parts of the interrupted boundary-layer will separate non-turbulently from the tube inner surface between the interruption spots and mix with the core layer to effect heat transfer between the tube inner surface, its respective boundary-layer, and the core-layer; and

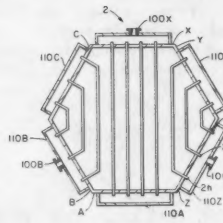
the space between the longitudinally extending rows being filled with a space-filling material to prevent useless flow of fluid in the part of the tube interior remote from the tube inner surface.

4,593,755

HEAT EXCHANGER

Elmer H. Rogers, Jr., Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 26, 1984, Ser. No. 665,188
Int. Cl.[4] F28F *9/02*
U.S. Cl. 165—145 6 Claims



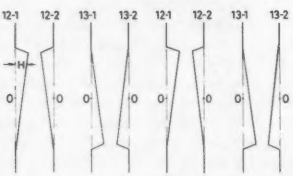
1. A heat exchanger comprising a plurality of tubes arranged in at least three side-by-side planes, the tubes being held at their ends in the sidewalls of an even-sided polygon of at least six sidewalls, each sidewall being connected to its opposite sidewall by tubes in at least one of the planes, wherein, in any given plane, there are tubes lateral to the tubes connecting the opposite sidewalls, the lateral tubes extending between sidewalls lateral to the opposite walls.

4,593,756

FIN-AND-TUBE TYPE HEAT EXCHANGER

Masaaki Itoh, Tsuchiura; Hiroshi Kogure, Mano; Kenji Iino; Izumi Ochiai, both of Tochigi; Yukio Kitayama, and Masahiro Miyagi, both of Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 746,680
Claims priority, application Japan, Jun. 20, 1984, 59-125113
Int. Cl.[4] F28F *1/32*
U.S. Cl. 165—151 2 Claims



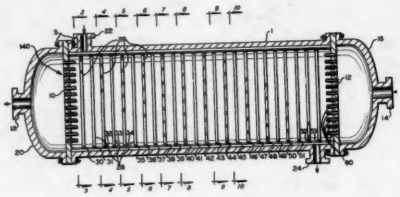
1. In a fin-and-tube type heat exchanger of the type which includes a large number of plate fins laminated in parallel with one another with a predetermined pitch p between them, a plurality of heat transfer tubes penetrating through said fins, and a large number of louvers disposed on said plate fins in such a manner as to extend in the longitudinal direction crossing at right angles both the direction of the air flow and the direction of lamination of said plate fins, the improvement wherein the cut-up height H of each of said raised, slotted louvers from the surface of a fin substrate continuously changes throughout the longitudinal direction of said louver in such a fashion that the greatest value of said height H is $\frac{1}{4}$ of a fin pitch P and the smallest value is zero, four to six kinds of louvers having different change patterns are disposed, said louvers consist of two to three kinds of louver pairs whose cut-up height H is symmetrical with respect to said fin substrate surface, and said two to three kinds of louver pairs are disposed sequentially and repeatedly in the direction of the air flow.

4,593,757

ROD BAFFLE HEAT EXCHANGE APPARATUS AND METHOD

William A. McClintock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 19, 1984, Ser. No. 662,866
Int. Cl.[4] F28F *9/00*
U.S. Cl. 165—162 20 Claims



1. Apparatus comprising:

(a) a tube bundle having a longitudinal length, a first end and a second end, wherein said tube bundle is formed from a plurality of parallel tubes arranged in at least a first plurality of parallel tube rows with lanes between the rows and at least a first plurality of parallel tube columns with lanes between the columns, wherein said tube bundle has a first end portion, a center portion and a second end portion, wherein said first end portion comprises about 30% of the longitudinal length of the tube portion comprises about 30% of the longitudinal length of the tube bundle originating from said first ends and wherein said second end portion comprises about 30% of the longitudinal length of the tube bundle originating from said second end; and

(b) a support means comprising a plurality of rod baffle sets wherein each rod baffle set comprises an outer ring having a plurality of support elements attached thereto to form parallel chords with said outer ring, wherein the density of support elements per unit length of the tube bundle in the first end portion and in the second end portion is less than the density of support elements per unit length of the tube bundle in the center portion of the tube bundle.

4,593,758

HERMETICALLY SEALED INSULATING ASSEMBLY

James C. Kyle, 2547 Fisher Rd., Roseburg, Oreg. 97470

Division of Ser. No. 322,014, Nov. 16, 1981, which is a continuation of Ser. No. 111,787, Jan. 9, 1980, abandoned. This application May 2, 1984, Ser. No. 606,395
Int. Cl.[4] E21B *33/10*
U.S. Cl. 166—65.1 24 Claims

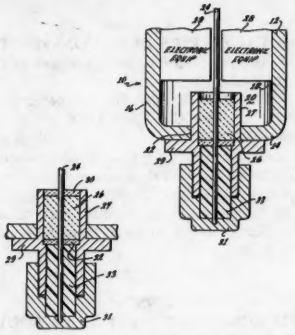
1. In combination for holding and protecting electrical instruments in a well which is subjected to pressures to approximately twenty six thousand pounds per square inch and temperatures to approximately 700° F.,

a rod,

a body disposed in spaced and enveloping relationship to the rod and shaped to define a sheltered area for holding the electrical instruments in the sheltered area at minimal pressures and temperatures and having a first surface defining the boundaries of the sheltered area and having a second surface opposite to the first surface for receiving such pressures to approximately twenty six thousand pounds per square inch and such temperatures to approximately 700° F. in the well, and

a non-hygroscopic ceramic insulating material disposed between the rod and the body and hermetically sealing the rod and the body and having partially amorphous and

partially crystalline characteristics and having properties of withstanding pressures of approximately twenty six



thousand pounds per square inch at temperatures to approximately 700° F.

4,593,759

METHOD FOR THE RECOVERY OF VISCOUS OIL UTILIZING MIXTURES OF STEAM AND OXYGEN

Joe E. Penick, Chappaqua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,406
Int. Cl.⁴ E21B *43/243*
U.S. Cl. 166—261 **5 Claims**

1. A method for the recovery of oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well and at least one production well, both wells being in fluid communication with the oil-containing formation, and having fluid communication therebetween consisting essentially of the following steps in the recited order:

(a) injecting a sufficient amount of steam into the formation via the injection well to displace oil in the formation immediately surrounding the injection well away from the well into the formation;

(b) thereafter injecting a mixture of steam, having a quality of 50 to 90% and the temperature of 350° to 650° F., and an oxygen-containing gas into the formation via the injection well wherein the ratio of molecular oxygen in the oxygen-containing gas to steam is within the range of 360 to 1800 SCF of oxygen per barrel of steam (cold water equivalent) to effect a substantially complete combustion of at least a portion of the oil to carbon dioxide and water; and

(c) recovering fluid including oil from the formation via the production well.

4,593,760

REMOVAL OF VOLATILE CONTAMINANTS FROM THE VADOSE ZONE OF CONTAMINATED GROUND

Melvin J. Visser, Portage, Mich., and James J. Malot, Dorado, , assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 4, 1984, Ser. No. 567,972
Int. Cl.⁴ E21B *43/00*
U.S. Cl. 166—267 **3 Claims**

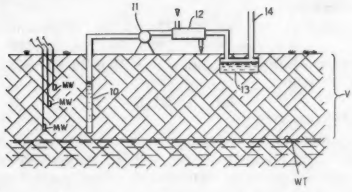
1. A process for removing a not-naturally-occurring, volatile liquid contaminant from a contaminated area of the earth, wherein the contaminated area of the earth has a subsurface water table and a subsurface vadose zone above the water table, the contaminant being present in the vadose zone, which comprises the steps of:

establishing a borehole extending downwardly from the surface of the ground within the contaminated area;

placing a first conduit within said borehole so that a ring-shaped zone is formed between the wall of said borehole and said conduit, said conduit having a perforate lower portion located in the vadose zone and spaced vertically above the water table so that fluids can flow from the vadose zone into the interior of said conduit, said perforate lower portion having an upper end and a lower end, said conduit having an imperforate upper portion above the upper end of said perforate lower portion,

filling fluid-permeable first fill material into a lower portion of said ring-shaped zone around said perforate lower portion of said conduit and which extends to the upper end of said perforate lower portion so that said first fill material will permit fluid readily to flow into said perforate lower portion of said conduit;

filling a second fill material of low fluid permeability into an



upper portion of said ring-shaped zone around said imperforate upper portion of said conduit, said second fill material being effective to impede flow of air from the surface of the ground to the lower portion of the borehole;

applying a vacuum to the upper end of said conduit effective to induce flow of air and a gas containing vapor of said contaminant present in said vadose zone into the lower portion of said conduit and thence to the upper end of said conduit, the vacuum being effective to cause vaporization of a substantial quantity of said contaminant within the vadose zone around the borehole so that said contaminant is removed from the ground in vapor form, and

accumulating liquid in the lower end of said conduit and pumping said liquid to the upper end of said conduit separately from said gas.

4,593,761

MISCIBLE OIL FLOODING AT CONTROLLED VELOCITIES

Donald L. Hoyt, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 20, 1984, Ser. No. 632,994
Int. Cl.⁴ E21B *43/16*
U.S. Cl. 166—268 **6 Claims**

1. A method for stimulating the production of hydrocarbons from an underground reservoir penetrated by spaced injection and production systems, comprising:

injecting a miscible flooding medium predominantly composed of a gas selected from the group consisting of carbon dioxide and nitrogen,

said flooding medium being injected at a rate to produce a flow velocity in the reservoir of about two to about fifteen times a critical velocity, as defined by the relationship

$$V_c=[2.741k\Delta\rho(\sin a)]/\phi\Delta\mu,$$

wherein

V_c is the critical velocity in feet per day,

k is the permeability of the reservoir in darcies,

ϕ is the fractional mobile fluid porosity of the reservoir which is $\phi_r(1-S_{wr}-S_{or})$ where ϕ_r is the rock porosity, S_{wr} is the residual water saturation, S_{or} is the residual oil saturation,

a is the dip angle of the reservoir in degrees,

$\Delta\rho$ is the density differential between the displaced fluid and the displacing fluid in grams per cubic centimeter, and

$\Delta\mu$ is the viscosity differential between the displaced fluid and the displacing fluid in centipoise; and

decreasing the injection rate of the miscible flooding medium to produce a flow velocity in the reservoir less than critical velocity after the flooding medium has traveled about 60% to about 90% of the distance from the injection system to the production system.

4,593,762

HIGH POLYMER SOLUTIONS HAVING AN INCREASED DRAG AND PROCESS FOR THEIR MANUFACTURE

Werner Interthal, Rüsselsheim; Franz-Josef Durst, Pfinztal-Berghausen, and Raimund Haas, Achern, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 306,072, Sep. 28, 1981, abandoned. This application Nov. 4, 1983, Ser. No. 549,216

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037630

Int. Cl.[4] E21B *43/16*

U.S. Cl. 166—275 **12 Claims**

1. A method for increasing drag in a flowing liquid under conditions of elongation flow, which essentially consists of:

causing the drag to be increased by means of the combination of a soluble high polymer and one or more completely soluble or miscible compounds which have a molecular weight of less than 500,000, said combination increasing the viscosity of the liquid to a value of up to about 1 Pa.s.

4,593,763

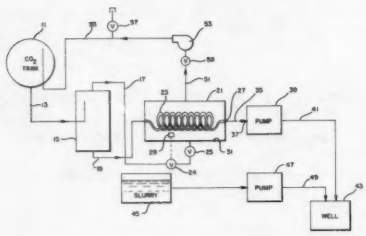
CARBON DIOXIDE WELL INJECTION METHOD

Edward M. Burke, Willow Park, Tex., assignor to Grayco Specialist Tank, Inc., Fort Worth, Tex.

Filed Aug. 20, 1984, Ser. No. 642,148

Int. Cl.[4] E21B *43/25, 43/267*

U.S. Cl. 166—302 **5 Claims**



1. In a method of injecting carbon dioxide into a well including the steps of transporting the carbon dioxide to the well site in a tank, maintaining the temperature and pressure during transporting to maintain the carbon dioxide predominantly in a liquid state, withdrawing the carbon dioxide from the tank, pumping liquid carbon dioxide down the well with a high pressure pump, passing the carbon dioxide withdrawn from the tank through a vapor separator chamber where a liquid-vapor stream is separated from a predominantly liquid stream of carbon dioxide, feeding the predominantly liquid stream to a high pressure side of a heat exchanger, feeding the liquid-vapor stream to a low pressure side of the heat exchanger to further cool the predominantly liquid stream passing through the high pressure side of the heat exchanger, recirculating expanded vapor from the low pressure side of the heat exchanger to the tank, and passing the cooled liquid stream of carbon dioxide flowing through the heat exchanger to the high pressure well pump for pumping into the well, the improvement comprising:

maintaining a minimum back pressure within the low pressure side of said heat exchanger by providing a back pressure valve in the recirculation path from said low pressure side of said heat exchanger leading to said tank.

4,593,764

REMOVAL OF PIPE DOPE CONSTRICTIONS

Walter B. Lilienthal, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 8, 1984, Ser. No. 669,281

Int. Cl.[4] E21B *37/00*

U.S. Cl. 166—312 **8 Claims**

1. A process for removing pipe dope restriction of fluid communication between a subterranean formation and a well bore comprising:

contacting the pipe dope with an effective amount of a liquid perhaloalkane having no more than three carbon atoms per molecule.

4,593,765

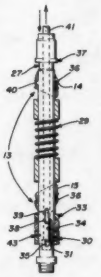
TUBING RESETTABLE WELL TOOL

Donald R. Greenlee, Cedar Hill, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 3, 1984, Ser. No. 627,696

Int. Cl.[4] E21B *23/06, 33/129*

U.S. Cl. 166—387 **21 Claims**



1. In a tool including means for connecting said tool to a tubing string for manipulation of the tubing string to set, unset and reset a slip assembly of the tool against the casing in a well without the necessity of pulling the tubing string from the well, the improvement comprising an adapter with one end frangibly connectable to a wireline setting device and an opposite end operably connected to said slip assembly for a first setting of the slip assembly with the wireline device.

15. In a method for setting, unsetting and resetting a tool against the casing in a well by manipulation of a tubing string, the improvement comprising the steps of first setting the slip assembly downhole in the well using a wireline setting device and, thereafter, connecting the tubing string to the tool as set downhole in the well for subsequent unsetting and resetting of the slip assembly by manipulation of the tubing string and without necessarily pulling the tubing string and tool from the well.

4,593,766

STRAFING PIT CONDITIONING APPARATUS WITH MAGNETIC SWEEPER

Gordon G. Gossard, 16263 Cabrillo Dr., Victorville, Calif. 92392

Filed Nov. 16, 1984, Ser. No. 671,937

Int. Cl.[4] B66C *1/06;* A01B *43/00;* B03C *1/00*

U.S. Cl. 171—63 **8 Claims**

1. Ground conditioning means for maintaining the strafing pit area of an aircraft gunnery range in good condition for target practice with reduced risk of projectile ricochet during such practice, comprising:

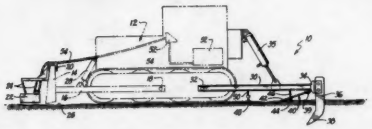
crawler tractor means;

magnetic sweeper means carried by the crawler tractor means including an electromagnetic extending crosswise of the path of movement of said crawler tractor means, support means for holding the electromgnet above the ground surface and control means operable by the tractor operator for adjusting the distance of the electromagnet above the ground to a desired level for recovering spent projectiles from a strafing pit area being traversed by said crawler tractor means;

ground breaking means pivotally supported on the crawler tractor means for penetrating and loosening the earth in said strafing pit area;

power means on said crawler tractor means for raising and lowering the ground breaking means;

rock rake means on said crawler tractor means having a plurality of tines pointing in the direction of movement of



the crawler tractor means and angled to rake the ground surface, pick up rocks therefrom, and convey the rocks away from the strafing pit area when the crawler tractor means is in operation; and

drag means comprising a relatively heavy crossbar positioned crosswise of the path of travel of said crawler tractor means and suspension means for supporting said crossbar on said ground conditioning means at a level to ride in contact with the ground during operation of said ground conditioning means;

whereby the ground conditioning means simultaneously digs into and softens the earth in a strafing pit area and leaves it substantially free of any rocks and spent projectiles from prior aircraft target practice runs which could cause projectiles to ricochet into the flight paths of future aircraft performing such runs.

4,593,767

IMPACT DEVICE

Fritz Isenring, Cnr. Beak & Butler Sts., Clinton Heights, Gladstone, Queensland, Australia (4680)

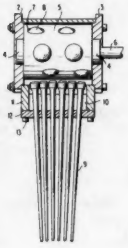
PCT No. PCT/AU81/00093, § 371 Date Mar. 30, 1982, § 102(e) Date Mar. 30, 1982, PCT Pub. No. WO82/00430, PCT Pub. Date Feb. 18, 1982

Continuation of Ser. No. 364,935, Mar. 30, 1982, abandoned. This PCT application Jul. 20, 1981, Ser. No. 652,547

Claims priority, application Australia, Aug. 4, 1980, PE4857; Nov. 13, 1980, PE6476

Int. Cl.[4] B25D *11/00*

U.S. Cl. 173—98 **1 Claim**



1. An impact device comprising a hollow cylindrical body having an inner wall surface, a rotatable member located within said body for rotation about a rotational axis, said rotatable member being comprised of a cylindrical element having at least three radially disposed apertures therein arranged along a helical line extending about the periphery of said cylindrical element, energy transfer means located in each aperture for radial movement therein and disposed in engagement with said inner wall surface of said body for movement along a substantially circulr path upon rotation of said rotatable member and impact means supported and constrained for limited linear movement with one end of said impact means being engageable with said energy transfer means, said impact means being comprised of a row of pins disposed in a straight line parallel to the axis of said cylindrical element whereby upon rotation of said rotatable member said energy transfer means located in each aperture will sequentially engage said impact members under the direct influence of centrifugal force thereby imparting energy to said impact means to effect said linear movement.

4,593,768

HYDRAULICALLY OPERATED IMPACT DEVICE

Ake T. Eklöf, Skärholmen, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

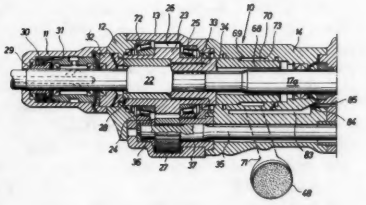
Continuation of Ser. No. 346,238, Feb. 5, 1982, Pat. No. 4,494,614. This application Nov. 5, 1984, Ser. No. 668,261

Claims priority, application Sweden, Feb. 11, 1981, 8100961

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] B23B *45/16*

U.S. Cl. 173—116 **14 Claims**



1. An hydraulically operated impact device, e.g. a rock drill, comprising:

a reciprocably driven hammer piston (**17***a–c*) arranged to impact upon an anvil means of a tool member (**22**);

a supporting member (**33, 34**) for axially supporting the tool member (**22**);

means defining a pressure chamber (**70**);

means for constantly connecting said pressure chamber (**70**) to a source of high pressure fluid;

a support piston (**68**) which is slidable in a cylinder means and which is subject to hydraulic pressure in said pressure chamber (**70**) in order to bias said supporting member (**33, 34**) into a defined forward end position;

narrow clearances (**75, 76**) located between relatively moving surfaces of said support piston (**68**) and said cylinder means in which said support piston (**68**) is slidable, said narrow clearances (**75, 76**) forming narrow leak passages from said pressure chamber (**70**);

sealing rings (**79, 80**) located at the outer end portions of said narrow clearances (**75, 76**) to seal off the ends of said narrow clearances between said support piston (**68**) and said cylinder means;

passages (**81, 82**) leading from portions of said narrow clearances interior of said sealing rings and communicating with said narrow clearances (**75, 76**); and

restricted channel means (**84**) connected to said narrow clearances (**75, 76**) via said passages (**81, 82**), said narrow clearances (**75, 76**) being connected in series with said passages (**81, 82**) and said restricted channel means (**84**) to

a sump, said restricted channel means (84) being connected between said narrow clearances (75, 76) and said sump.

4,593,769

ROTARY ROCK DRILLING CHUCK

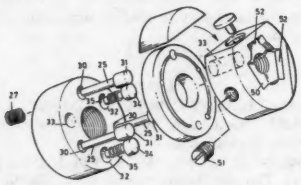
Charles J. Armstrong, Randburg, South Africa, assignor to Boart International Limited, Transvaal, South Africa

Filed Aug. 16, 1984, Ser. No. 641,377

Claims priority, application South Africa, Aug. 16, 1983, 83/6017

Int. Cl.[4] E21C 5/00

U.S. Cl. 173—145 8 Claims



1. A chuck for use with a rotary drilling machine having a front end, and a feed screw connected to the front end and supported for forward and rearward reciprocating movement relative thereto, the chuck comprising:

a body adapted to be carried by the feed screw, forming a socket for receiving a drill rod, and including a plurality of movable jaws to clamp the drill rod in the socket; and

a hydraulic circuit including

(i) drive means to move the jaws,

(ii) an accumulator for holding pressurized fluid, said accumulator being charged on rearward movement of the feed screw to a charging position,

(iii) means for conducting pressurized fluid from the accumulator to the drive means to move the jaws and clamp the drill rod in the socket,

(iv) a sump to hold a supply of fluid,

(v) means to conduct pressurized fluid from the drive means to the sump to unclamp the drill rod from the jaws,

(vi) a pumping cylinder,

(vii) means to conduct fluid from the sump to the pumping cylinder,

(viii) means to conduct fluid from the pumping cylinder to the accumulator,

(ix) a plunger supported for reciprocating movement in the pumping cylinder, the plunger being pushed forward on rearward movement of the feed screw to the charging position to pressurize fluid in the pumping cylinder and to direct the pressurized fluid to the accumulator, and

(x) a spring engaging the plunger and urging the plunger rearward to draw fluid into the pumping cylinder from the sump;

the body of the chuck further including

a first cavity forming the accumulator,

a second cavity forming the sump,

a third cavity forming the pumping cylinder,

first internal channel means forming the means to conduct fluid from the sump to the pumping cylinder,

second internal channel means forming the means to conduct pressurized fluid from the cylinder to the accumulator, and

third internal channel means forming the means for conducting pressurized fluid from the accumulator to the drive means.

4,593,770

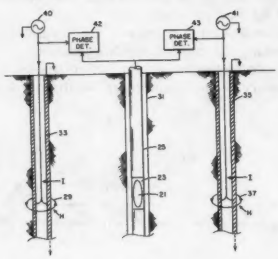
METHOD FOR PREVENTING THE DRILLING OF A NEW WELL INTO ONE OF A PLURALITY OF PRODUCTION WELLS

Gustave L. Hoehn, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 6, 1984, Ser. No. 668,922

Int. Cl.[4] E21B 46/00

U.S. Cl. 175—45 3 Claims



1. A method for preventing the drilling of a first well into any one of a plurality of second wells, comprising the steps of:

(a) lowering a borehole tool into one of said plurality of second wells and injecting an alternating current flow into the well casing of said well from said tool at a selected depth point such that a first magnetic field is created above said point of injection around said well due to the difference in the opposing current flows downward through said borehole tool and its support cable to said point of injection and upward through said well casing from said point of injection and a second magnetic field is created below said point of injection around said well casing due to the downward current flow from said point of injection, said first and second magnetic fields being equal in both direction and magnitude so as to create a uniform magnetic field along the length of the well casing both above and below said point of injection,

(b) repeating step (a) for each of the remaining ones of said second wells utilizing a differing alternating current frequency for each of said second wells to create a magnetic field around each of said second wells, each of said magnetic fields having a differing detectable characteristic based on the phase of the alternating current creating said magnetic field,

(c) locating a magnetometer in a non-magnetic section of the drill string of said first well,

(d) measuring the magnetic field intercepted by said magnetometer during the drilling of said first well, and

(e) redirecting the drilling of said first well when the measurement of said magnetic field indicates that the continued drilling of said first well would result in the intersection of said first well with one of said second wells.

4,593,771

TUBING-CONVEYED EXTERNAL GAUGE CARRIERS

Laurier J. Comeau, Edmonton, Canada, assignor to NL Sperry-Sun of Canada, Ltd., Edmonton, Canada

Filed Feb. 23, 1984, Ser. No. 582,647

Int. Cl.[4] E21B 47/06, 49/10, 17/16

U.S. Cl. 175—48 9 Claims

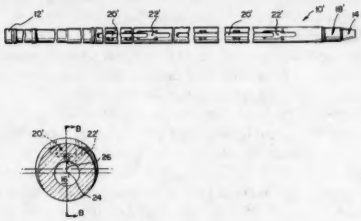
9. An apparatus for use in full-bore drill stem testing, comprising:

an instrument for measuring a downhole parameter;

eccentrically ground carrier means for use as a component in a drill string;

bore means in said carrier means for providing continuous fluid communication between the bores of other components in said drill string and wherein said bore means in

said carrier means produces substantially no pressure drop to fluids flowing therethrough; and



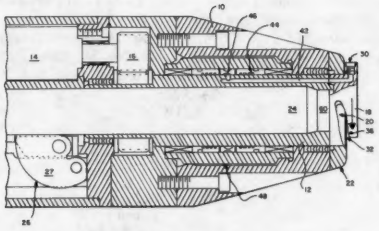
groove means on the exterior of said carrier means for housing and protecting said instrument wherein said groove means is located on the major eccentric side of said carrier means with respect to said bore means.

4,593,772

ROTARY CUTTER FOR CABLE FOLLOWING APPARATUS

Douglas P. Kelley, Redmond, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 414,483, Sep. 2, 1982, abandoned. This application Jan. 18, 1984, Ser. No. 572,092
Int. Cl.[4] E21B *19/08, 23/00*
U.S. Cl. 175—53 **18 Claims**



1. An apparatus for moving along the length of an existing underground cable in a forward direction comprising a main body, means for moving said main body in a forward direction along said cable, a cylinder within said main body through which said cable passes, an annulus carried by said main body surrounding the front portion of said cylinder and rotating around said cylinder to clean obstructions away from said cable.

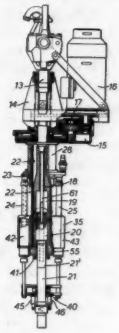
4,593,773

WELL DRILLING ASSEMBLY

Bjarne E. Skeie, Kristiansand, Norway, assignor to Maritime Hydraulics A.S., Kristiansand S, Norway

Filed May 14, 1984, Ser. No. 609,883
Claims priority, application Norway, Jan. 25, 1984, 840285
Int. Cl.[4] E21B *19/06, 19/00*
U.S. Cl. 175—85 **11 Claims**

1. A well drilling assembly of the type in which a rotary device is suspendable by a hook of a derrick hoisting means, to which rotary device, a hollow shaft assembly is connected having a threaded end which is adapted to be coupled to the end of a drill string, which has complementary threads, and wherein a drill pipe elevator is suspended below the rotary device by two links, characterized in that the hollow shaft assembly includes an expanded section and a shaft pin which is telescopic relative to the expanded section, that externally of the hollow shaft assembly there is lifting means for moving the shaft pin telescopically relative to the expanded section, and that the elevator is suspended by two links and is axially mov-



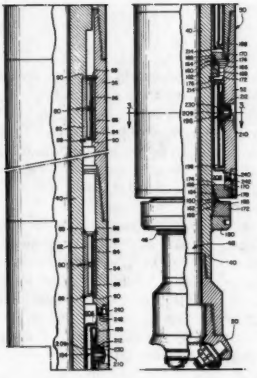
able in relation to the hollow shaft assembly by means of a slidable link hanger.

4,593,774

DOWNHOLE BEARING ASSEMBLY

Jerry Lingafelter, Wichita Falls, Tex., assignor to Geo Max Drill Corp., Hollywood, Fla.

Filed Jan. 18, 1985, Ser. No. 692,690
Int. Cl.[4] E21B *4/02*
U.S. Cl. 175—107 **10 Claims**



1. A sealed downhole bearing assembly comprising:
an outer tube adapted to be connected to a first portion of a drill string;
an inner tube adapted to be connected to a second portion of a drill string and disposed within the outer tube to define an enclosed annular space therebetween;
at least one bearing mounted in the annular space between the outer and inner tubes to allow relative rotation therebetween;
at least one high pressure seal mounted in the annular space between the outer and inner tubes to divide the annular space into first and second chambers;
first and second abrasion resistant, metal-to-metal seals mounted between the inner and outer tubes to seal the first and second chambers, respectively, said first seal in fluid communication with an outer region exterior of the outer tube and said second seal in fluid communication with an inner region interior of the inner tube, said metal-to-metal

seals adapted to seal effectively when in contact with drilling mud;

first and second pressure balancing systems in communication with the first and second chambers, respectively, said first pressure balancing system also in communication with the outer region to balance pressure in the first chamber with respect to the outer region, said second pressure balancing system also in communication with the inner region to balance pressure in the second chamber with respect to the inner region;

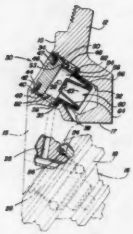
each of said pressure balancing systems comprising respective flexible, variable volume containers.

4,593,775

TWO-PIECE PRESSURE RELIEF VALVE

John P. Chaney, Huntington Beach, and William Van De Nobelen, Placentia, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 18, 1985, Ser. No. 724,428
Int. Cl.[4] E21B *10/22*
U.S. Cl. 175—228 **15 Claims**



1. A pressure compensation lubricant reservoir mechanism for a sealed bearing rotary cone rock bit comprising:

a rock bit body, said body forming an open-ended lubrication cavity therein, said body further forming lubrication conduits from said cavity to one or more rock bit bearings and at least one channel formed by said body communicating from said cavity to a dome portion formed by said rock bit body,

an expandable boot forming a boot retention flange at an opened end thereof, said boot flange seats against a shoulder portion formed by said body within said cavity,

a first hollow canister having first and second opened ends shaped to fit within said cavity, said second end of said canister seats against said boot flange,

a second cover cap canister having first and second ends, shaped to complement said first canister, said second end of said cover cap forming an annular recessed L-shaped receptacle therearound, said receptacle accepts a resilient packing gland therein, said second end of said cover cap seats against said first end of said first canister to close out said L-shaped receptacle for said packing gland, and

spring biasing means adjacent said first end of said cover cap canister, said spring means is positioned between a cover cap retainer, said cover cap retainer is retained within a means formed in said bit body within said cavity, said spring means biases said second cover cap canister and said first canister against said boot flange, the resilient packing gland being positionable within said reservoir cavity without damage during an assembly of said lubricant reservoir mechanism thereby assuring a cover cap seal for said lubricant reservoir.

15. A pressure compensation lubricant reservoir mechanism for a sealed bearing rotary cone rock bit comprising:

a rock bit body, said body forming an open ended lubrication cavity therein, said body further forming lubrication conduits from said cavity to one or more rock bit bearings and at least one channel formed by said body communicating from said cavity to a dome portion formed by said rock bit body,

an expandable boot forming a boot retention flange at an opened end thereof, said boot flange seats against a shoulder portion formed by said body within said cavity,

a first hollow canister having first and second opened ends shaped to fit within said cavity, said second end of said canister seats against said boot flange,

a second cover cap canister having first and second ends, shaped to complement said first canister, said second end of said cover cap forming an annular recessed L-shaped gland therearound, said gland accepts an elastic O-ring therein, said second end of said cover cap seats against said first end of said first canister to close out said L-shaped gland for said O-ring, and

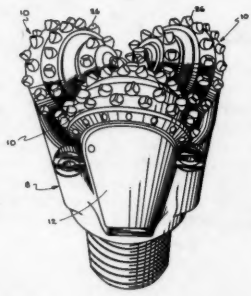
spring biasing means adjacent said first end of said cover cap canister, said spring means is positioned between a snap ring cover cap retainer, said snap ring being retained within an annular groove formed in said bit body within said cavity, said spring means biases said second cover cap canister and said first canister against said boot flange, the O-ring being positionable within said reservoir cavity without damage during an assembly of said lubricant reservoir mechanism thereby assuring a cover cap seal for said lubricant reservoir.

4,593,776

ROCK BITS HAVING METALLURGICALLY BONDED CUTTER INSERTS

William J. Salesky, Huntington Beach; Gunes M. Ecer, Irvine, and Karl O. Kuhn, Laguna Niguel, all of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Continuation of Ser. No. 594,449, Mar. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 544,923, Oct. 24, 1983, abandoned. This application Jun. 14, 1985, Ser. No. 744,826
Int. Cl.[4] E21B *10/08*
U.S. Cl. 175—375 **57 Claims**



1. A cutter member of a rock bit, comprising:

a core, including an interior opening, wherethrough the cutter member may be mounted to a pin connected to a drill string, said core also including, on its exterior surface, a plurality of cavities;

a plurality of hard cutter inserts, the cavities and the cutter inserts having substantially matching dimensions so that the cutter inserts are accommodated in the cavities without substantial interference;

a cladding disposed on the exterior surface of the core, the cladding having been deposited by a powder metallurgy technique including a step wherein compacted powder of the cladding is heated to metallurgically bond said powder to the core, the cladding being substantially harder than the core, said cladding partially embedding the cutter

inserts and metallurgically bonding said inserts to the core and to the cladding, and

means disposed on the cutter inserts for substantially preventing diffusion of carbon from the cutter inserts into the core and the cladding during the step wherein compacted powder of the cladding is heated to metallurgically bond the same to the core.

19. A process for making a cutter member of a rock bit of the type mounted through a pin to a drill string, the cutter member having a plurality of tungsten-carbide cutter inserts, the process comprising the steps of:

depositing a thin layer of a material selected from a group consisting of graphite, copper, copper alloys, silver, silver alloys, cobalt, cobalt alloys, tantalum, tantalum alloys, gold, gold alloys, palladium, palladium alloys, platinum, platinum alloys, nickel, and nickel alloys on the cutter inserts;

after said step of depositing, placing a plurality of the cutter inserts into cavities formed in the outer surface of the solid core of the cutter member, said cavities being dimensioned to accept the cutter inserts without substantial interference;

depositing a suitable powder composition on the outer surface of the core so as to partially embed the cutter inserts, and

heating and pressing the powder in a suitable mold to metallurgically bond said powder and said cutter inserts to the member and thereby to provide an exterior cladding of the cutter member, said cladding having a hardness of at least 50 Rockwell C units, substantially conforming to the desired final exterior configuration of the cutter member, and being comprised of a material selected from a group consisting of metals and cermets.

4,593,777

DRAG BIT AND CUTTERS

John D. Barr, Gloucestershire, England, assignor to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 468,669, Feb. 22, 1983, Pat. No. 4,558,753. This application Feb. 8, 1984, Ser. No. 578,183

The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.

Int. Cl.[4] E21B *10/46*

U.S. Cl. 175—379 **16 Claims**

1. A drag-type drill bit comprising:

a bit body adapted for rotative movement in a pre-determined direction in use and having an operating end face;

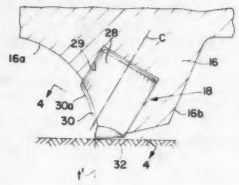
and a plurality of self-sharpening cutting members mounted in said bit body and adapted to cut an earth formation to a desired three-dimensional profile, each of said cutting members having

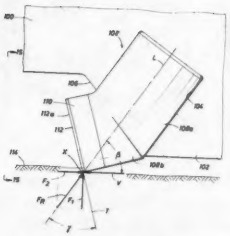
a stud portion disposed in a respective recess in said bit body and defining the inner end of said cutting member,

and a cutting face generally adjacent its outer end facing outwardly through said end face of said bit body and terminating in an outermost cutting edge having a midpoint,

the centerline of said stud portion being rearwardly inclined from said outer end to said inner end with respect to said direction of movement in use—taken at the midpoint of said cutting edge—at a first angle from 80° to 30° inclusive;

and said cutting face being oriented such that the tangent to said cutting face at the midpoint of said cutting edge and in the central plane of the cutting member, is disposed at a second angle, from 18° to 75° inclusive, with respect to the centerline of said stud portion;





said cutting faces defining surfaces having back rake angles which become more negative with distance from said profile.

4,593,778

WEIGHING MACHINE WITH DUMMY LOAD CELL FOR ERROR CORRECTION

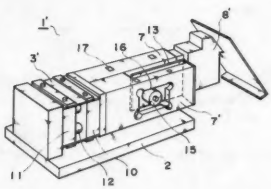
Satoshi Konishi, Kusatsu; Kazumi Kitagawa, Shiga, and Michito Utsunomiya, Kusatsu, all of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Jun. 13, 1984, Ser. No. 620,040

Claims priority, application Japan, Jun. 21, 1983, 58-110150; Jan. 27, 1984, 59-12016

Int. Cl.[4] G01G *23/06, 23/10, 3/08*

U.S. Cl. 177—185 **2 Claims**



1. In a weigh machine, a load cell, having at one end thereof a support for supporting a weighing machine, is connected at the other end thereof to a second support which is connected to a frame through an elastic body, the improvement being that said load cell is connected through said second support to said frame through an antivibration damper said improvement further comprising a dummy load cell, separate from said load cell and attached to said second support, said dummy load cell being spaced from said load cell and having a dummy mass which has the same natural frequency as said load cell, said dummy mass being provided on a third support mounted at the end of said dummy load cell and curved back between said dummy load cell and said load cell and situated in frame holes formed in both the said load cell and said dummy load cell, and

said second support is attached to said frame in cantilever fashion.

4,593,779

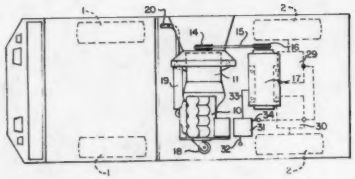
COMBINATION INTERNAL COMBUSTION AND ELECTRICAL DRIVE VEHICLES

Erich Kröhling, Reinbek, Fed. Rep. of Germany, assignor to Still GmbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 451,973, Dec. 21, 1982, abandoned. This application Jun. 14, 1985, Ser. No. 745,060

Int. Cl.[4] B60L *11/12*

U.S. Cl. 180—65.4 **6 Claims**



1. A combination internal combustion and electric drive vehicle particularly for carrying a payload in and out of enclosed areas, comprising a frame, supporting wheels on a pair of spaced generally parallel axles on said frame, at least one electric drive motor drivingly connected to at least one of said supporting wheels, a battery container suspended from said frame between said axles, a battery in said container, an internal combustion engine on said frame, a first electric generator connected to and driven by said internal combustion engine and first electrical connections from said first generator to said electric drive motor whereby electrical energy from said first generator may be used to drive said electric drive motor when the vehicle is outside an enclosed area and second electrical connections from said battery to the electric drive motor for driving said drive motor independently of the internal combustion engine and with the internal combustion engine stopped in enclosed areas, a second constant voltage generator driven by said internal combustion engine connected to said battery whereby said battery is being recharged at all times when the internal combustion engine is operating and a switch box for selectively connecting said battery to said second generator or said electric drive motor.

4,593,780

POWER ASSIST STEERING GEAR ASSEMBLY

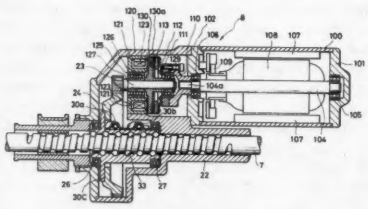
Naoki Saito, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,072

Claims priority, application Japan, Jul. 22, 1983, 58-132827

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—79.1 **6 Claims**



1. Power assist steering assembly for vehicles comprising:

rotary shaft means connected to a steering wheel to be rotated in unison therewith;

an elongated member linearly movable in opposite directions for pivoting of dirigible wheels;

cylindrical means supported by a vehicle body and circumscribing the elongated member to support the elongated member for linear movement in said opposite directions, but non-rotatably;

rack and pinion gear means for drivingly connecting the rotary shaft means and the elongated member, the gear means including a pinion gear rotatable in unison with the rotary shaft means and a rack gear provided in the elongated member and disposed in meshing emgagement with the pinion gear;

ball screw and nut means including thread means provided at a peripheral portion of the elongated member, rotatable nut means coaxially circumscribing at least a portion of said thread means and rotatably supported by said cylindrical means, and ball means for transmitting force from said nut means to said thread means;

an electric rotary motor including a stator, a rotor and a rotation output member connected to the rotor, the electric motor being positioned radially outside of said cylindrical means;

rotation transmitting means for transmitting rotation from the motor to the nut means of the ball screw and nut means, the rotation transmitting means including reduction gear means drivingly connected to said nut means, and electromagnetic clutch means disposed between the rotation output member of the motor and said reduction gear means for transmitting rotation from the motor to the reduction gear means when the electromagnetic clutch means is engaged and for completely disconnecting the reduction gear means from the motor when the clutch means is disengaged;

means for detecting torque applied to the steering wheel; and

means for controlling the motor and the electromagnetic clutch means separately in response to detection of torque by the torque detecting means.

4,593,781

MOTOR VEHICLE STEERING SYSTEM ASSISTED BY AN ELECTRIC MOTOR

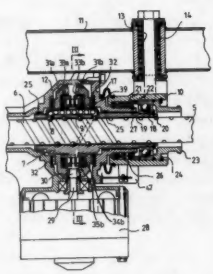
Lucien Galtier, Morsang S/Orge, France, assignor to Automobiles Citroen, Neuilly, France

Filed Dec. 13, 1984, Ser. No. 681,492

Claims priority, application France, Dec. 16, 1983, 83 20520

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—79.1 **6 Claims**



1. In a motor vehicle steering system with assisted control comprising a steering column having teeth meshing with a rack connected by steering levers to the steering wheels on the vehicle, an electric motor for moving the rack through two clutches each associated with one of the directions of move-

ment of the rack, and means responsive to the force exerted between said steering column and said rack for engaging one or another of said clutches depending on the direction of said force, the improvement wherein said rack is contained in a case comprising a fixed part secured to the structure of said vehicle and a part which is mobile in the direction of said rack and on which said steering column is mounted, resilient means tending to maintain said mobile part in a mean position from which it may move in one direction or in the opposite direction, and said means responsive to said force includes said mobile part for engaging one or another of said clutches, the clutch engaged depending on the direction of the movement of said mobile part by said steering column and as a function of the movement of said mobile part.

4,593,782

SHAFT DRIVE APPARATUS FOR MOTOR VEHICLES

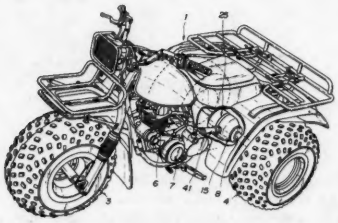
Hiroshi Nobusawa; Eiji Hosoya; Masahiro Imaizumi, all of Saitama, and Hitoyuki Takasu, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 639,166

Claims priority, application Japan, Aug. 8, 1983, 58-144816

Int. Cl.[4] B60G *9/00*

U.S. Cl. 180—88 **4 Claims**



1. A shaft drive apparatus in a motor vehicle having an engine and driving wheels drivable by the engine, comprising:

(a) an axle of the driving wheels;

(b) a drive shaft for transmitting power from said engine to said axle;

(c) final output means and brake means disposed adjacent to each other substantially axially centrally of said axle; and

(d) said drive shaft being disposed between said final output means and said brake means.

4,593,783

POWER STEERING SYSTEM

Susumu Honaga, Aichi; Mikio Suzuki, Hekinan, and Yoshiharu Inaguma, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 25, 1985, Ser. No. 727,079

Claims priority, application Japan, Apr. 27, 1984, 59-87221

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—141 **5 Claims**

1. A power steering system which utilzies a fluid pump driven by a drive source and a fluid motor for supplementing manual steering torque, comprising:

a valve housing;

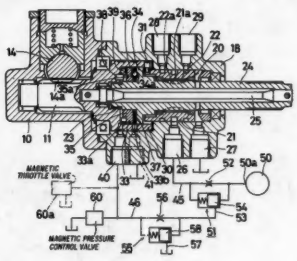
a rotatable output shaft partially positioned within said valve housing and operatively connected with said fluid motor;

a rotatable input shaft partially positioned within said valve housing and aligned with said output shaft and adapted for manual actuation;

rotary fluid control valve means located in said valve housing for distributing fluid flow to said fluid motor in accordance with relative rotation between said input and output shaft;

a reaction device located in said valve housing for providing resistance against relative rotation between said input and output shaft in accordance with fluid pressure supplied thereto;

first flow control valve means connected between said fluid pump and said rotary fluid control valve means for delivering a first fluid flow to said rotary fluid control valve means and for leading excess flow to a bypass passage;



second flow control valve means connected between said bypass passage and said reaction device for delivering a second fluid flow to said reaction device and for leading excess flow to a reservoir; and

magnetic pressure control valve means connected to said reaction device for controlling fluid pressure applied thereto in accordance with a predetermined vehicle operating condition.

4,593,784

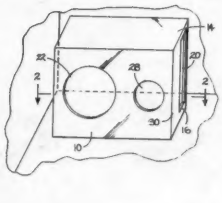
LOUDSPEAKER ENCLOSURE

Andrew E. Flanders, Cornelius, Oreg., assignor to C. Harold Weston, Jr., Portland, Oreg.

Filed May 3, 1984, Ser. No. 606,471

Int. Cl.[4] H05K *5/00*

U.S. Cl. 181—144 **7 Claims**



1. A loudspeaker enclosure comprising:

(a) a hollow box having external front, rear and lateral side walls, and external top and bottom walls,

(b) an opening in one of said external walls for association with one side of a loudspeaker which provides both front and back acoustic waves of bass and/or mid-range audio frequencies, and

(c) a port in a second of said external walls disposed substantially normal to the opening in said one wall, the port being arranged for association with the side of the loudspeaker opposite said one side and having a cross sectional area of about 0.5 to about 2.0 times the operative area of a loudspeaker to be associated therewith,

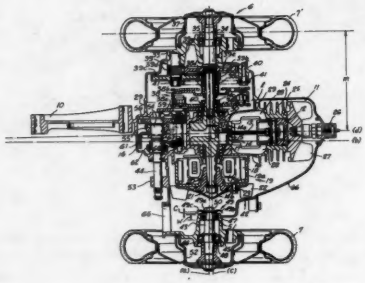
(d) the interior of the box between the wall opening and the port being proportioned and arranged to function as an acoustic transmission line which is terminated in the port.

4,593,785

POWER UNIT FOR A VEHICLE

Sadashi Yamamoto, and Takeo Ishihara, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,293
Claims priority, application Japan, Apr. 4, 1983, 58-59045
Int. Cl.[4] B62M 7/12
U.S. Cl. 180—291 7 Claims



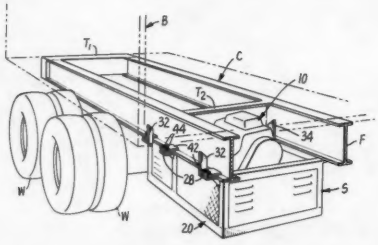
1. A power unit for a vehicle, comprising an engine housing;
a crankshaft rotatably mounted in said engine housing and having a coaxial bore in a first end thereof; and
a drive shaft, a first end of said drive shaft being rotatably mounted to said engine housing and a second end of said drive shaft being rotatably mounted in said coaxial bore of said crankshaft, said drive shaft having a driven connection with said crankshaft.

4,593,786

SELF-CONTAINED POWER SUPPLY AND SUPPORT THEREFOR

John Tate, 17285 Gehricke Rd., Sonoma, Calif. 95476

Continuation-in-part of Ser. No. 373,899, May 3, 1982, abandoned. This application Nov. 22, 1982, Ser. No. 443,487
Int. Cl.[4] B60K 5/10
U.S. Cl. 180—291 2 Claims



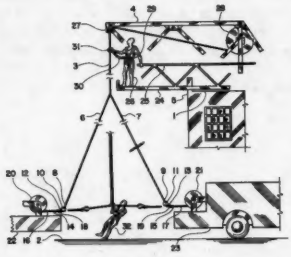
1. In combination with a wheel supported vehicle chassis having transversely spaced longitudinally extending frame members, an improved support for a power supply having an engine with an oil reservoir, said support comprising: longitudinally extending upper members spaced from one another by approximately the same distance as the longitudinally extending frame members of the chassis, said upper members defining therebetween an open space through which a power supply unit may extend; a downwardly depending framework carried by and rigidly interconnected with said longitudinally extending upper members, said framework having mounting means to mount a power supply within the framework with the upper end of the supply extending upwardly between the upper members; a closed loop tubular member included within and forming at least a portion of said framework to provide a supplemental oil reservoir for said engine; conduit means to establish fluid communication between the reservoir of the engine and said supplemental oil reservoir; thermostatic control means to control the flow of oil from said supplemental reservoir to the oil reservoir of the engine; and clamp means carried by said upper members to releasably clamp said members to the longitudinally extending frame members of the chassis.

4,593,787

SKY-SLIDE SYSTEM FROM ELEVATED STRUCTURES

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Michael Stranahan, P.O. Box 15, Woody Creek, Colo. 81656

Filed Dec. 19, 1983, Ser. No. 562,839
Int. Cl.[4] A62B 1/20
U.S. Cl. 182—3 6 Claims



1. A rapid descending system from an elevated structure to a lower level comprising in combination:
(a) a cord depending from an elevated structure, said cord branching into at least two branching cords;
(b) means for releasably securing the lower extremities of said branching cords respectively disposed at separate positions, said means including power-driven reels equipped with braking means for a powered take-up and braked release of said lower extremities of said branching cords wherein said power-driven reels take up said branching cords providing initial tension on and angle between said branching cords prior to a descending and said braking means provide continuous release of said branching cords at controlled speeds during a descending; and
(c) a harness including a clasp means secured to said harness securable to a person, said clasp means being an annular structure with opening-closing means, whereby, a person wearing said harness clasps said clasp means on said cord, jumps off from the elevated structure and lands safely on the lower level, as the tensions on said branching cords maintained by said braking means included in said power-driven reels during the release of said branching cords at controlled speed slows down the descending speed of the person.

4,593,788

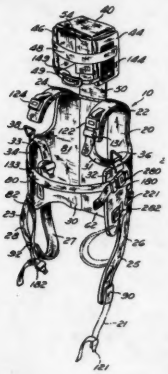
RESCUE APPARATUS

Larry Miller, P.O. Box 784, La Canada, Calif. 91011

Filed Feb. 21, 1984, Ser. No. 581,575
Int. Cl.[4] A61F 5/04
U.S. Cl. 182—3 11 Claims

1. Rescue apparatus comprising a vest of flexible material adapted to lie flat and to be wrapped about a person's torso, the vest including a back portion connected to the front body portions and straps for connecting the front body portions together around the front of the person, and the vest including shoulder portions connected to he back portions and having

straps for connecting the shoulder portions to the front portions, the vest further including means defining an elongated pocket in the back portion of the vest to extend along the person's spine, the pocket being closed at its lower end and open at its upper end and an elongated, thin, flat, wide stiffener



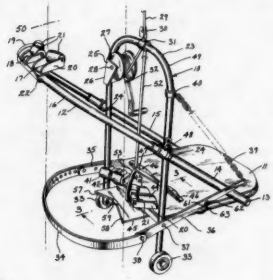
being positioned in said pocket to protect the person's spine, the stiffener extending out the upper end of the pocket to be in position to also support the person's head, said vest also including a head support for connection to the upper end of the stiffener, said support including means for connecting the support to the back upper portion of the vest.

4,593,789

TREE CLIMBING APPARATUS

Bill Treants, 5329 S. Skyline Dr., New Berlin, Wis. 53151

Filed Oct. 7, 1985, Ser. No. 784,952
Int. Cl.[4] A01M *31/02*; A45F *3/26*; A47C *9/10*
U.S. Cl. 182—142 **11 Claims**



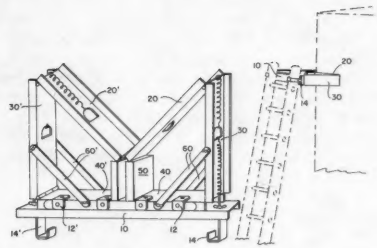
1. A tree or the like climbing apparatus comprising:
a platform adapted to be raised or lowered over a tree trunk or the like;
a supporting member extending from said platform for surrounding said tree trunk at a side opposite said platform;
tree trunk engaging means extending from said platform for penetrating said tree trunk;
biasing means operatively associated with said tree trunk engaging means to urge said tree trunk engaging means to penetrate said tree trunk;
means to release said biasing means; and
adjustable strap means operatively connected to said platform and surrounding said tree trunk on the same side as said supporting member.

4,593,790

CONVERTIBLE LADDER STABILIZER

James S. Brewer, 401 Rockcliff Dr., and William P. Allen, Rte. 1, Box 137, both of Martinsburg, W. Va. 25401

Filed Apr. 17, 1985, Ser. No. 724,258
Int. Cl.[4] E06C *7/48*
U.S. Cl. 182—214 **7 Claims**



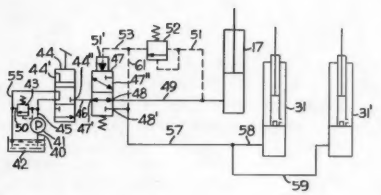
1. An extension ladder stabilizer which is convertible to variant configurations for stable contiguous contact with diverse building surface comprising:
(A) interconnected articulable extensions;
(B) a rigid connector engagable with at least one of said articulable extensions, the connector having at least one removable ladder sidepiece engaging clamp and spacing members on the connector to set the connector at an acute angle which is greater than 90 degrees, relative to a vertical line of the articulable extensions, whereby the stabilizer extensions may conform to the corresponding vertical position of a building surface, irrespective of the angular leaning relation of the ladder to the ground.

4,593,791

AUTOMATIC SEQUENCING CIRCUIT FOR LIFT CYLINDERS

Dean A. Matthews, Homewood, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 17, 1984, Ser. No. 601,255
Int. Cl.[4] B66B *9/20*
U.S. Cl. 187—9 E **4 Claims**



4. In a hydraulic control system comprising
first and second extensible hydraulic lift cylinder means wherein said first cylinder means requires a higher fluid pressure for its extension than is required for extension of said second cylinder means and
a fluid control system for sequentially operating said cylinder means including
a source of pressure fluid,
a control valve having raise, lower and hold positions of adjustment operatively associated with said source of fluid pressure and having a fluid supply port,
a pilot operated selector valve having a fluid supply port connected to said fluid supply port of said control valve and having first and second output ports,

a first conduit connecting said first output port in fluid communication with said first lift cylinder means,

a second conduit connecting said second output port with said second lift cylinder means,

a pilot conduit interconnecting said first conduit with said selector valve,

said selector valve having a normal position in which said supply port of said control valve is in fluid communication with said first lift cylinder means and a pilot operated position in which said control valve supply port is connected to said second lift cylinder means,

a relief valve in said pilot conduit opening at a first predetermined pressure thereby causing said selector valve to shift to its pilot operated position, and

a holding circuit including a conduit interconnecting said second conduit and said pilot conduit downstream of said relief valve.

4,593,792

APPARATUS FOR CONTROLLING A HYDRAULIC ELEVATOR

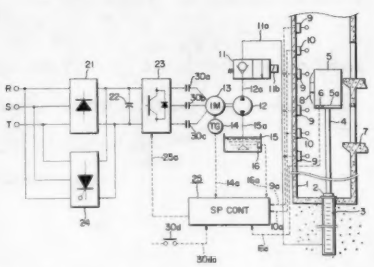
Tomoichiro Yamamoto, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,277

Claims priority, application Japan, Aug. 30, 1983, 58-158206; Sep. 29, 1983, 58-181073

Int. Cl.[4] B66B *1/26*

U.S. Cl. 187—29 B **16 Claims**



1. In an apparatus for controlling a hydraulic elevator in which an electric motor is controlled depending upon a pattern signal, and a hydraulic pump is driven by the electric motor to run a cage, the improvement comprising:

(a) a bias pattern generator means which generates a bias pattern signal to rotate said electric motor at a low speed within a range in which said cage does not move;

(b) a running pattern generator means which generates a running pattern signal to run said cage;

(c) a signal generator means which, when a start instruction is issued for the cage, sends a signal to said bias pattern generator means so that a bias pattern signal is generated;

(d) a delay signal generator means which sends a signal to said running pattern generator means which is delayed by a predetermined period of time after said starting instruction has been issued, so that a running pattern signal is generated; and

(e) an adder means which superposes said bias pattern signal and said running pattern signal, and which produces the thus superposed pattern signals to control the electric motor.

4,593,793

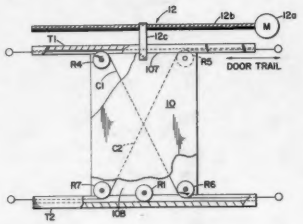
ELEVATOR DOOR CONFIGURATION

John K. Salmon, South Windsor, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Jan. 6, 1984, Ser. No. 568,958

Int. Cl.[4] B66B *13/00*

U.S. Cl. 187—56 **4 Claims**



1. In combination:

a door that is propelled horizontally by a door drive;

a door guidance track that is U-shaped and extends the direction in which the door is propelled along the lower edge of the door for receiving at least one roller that guides the lower edge of the door along the path of the track;

four rollers that are attached to the door at diagonally-opposed positions near the door corners;

a first cable whose ends are fixed relative to the door and which is directed from an attachment point around a first roller and then around a second roller which is diagonally opposite to an attachment point; and

a second cable whose ends are fixed relative to the door and which is directed from an attachment point around a third roller and then around a fourth roller to an attachment point;

each cable along the lower edge of the door being positioned within the U-shaped portion of the track throughout the door's range of travel; and

said cables are concealed in the interior of said door.

4,593,794

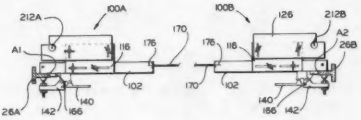
APPARATUS AND METHOD FOR INSTALLING ELEVATOR RAILS

Raymond J. Russeau, Sylvania, Ohio, assignor to Schindler Haughton Elevator Corporation, Toledo, Ohio

Filed Apr. 23, 1984, Ser. No. 602,829

Int. Cl.[4] B66B *7/02*

U.S. Cl. 187—95 **15 Claims**



1. A method of instaling guide rails in an elevator hoistway, comprising the steps of:

assembling at least a pair of rails each having a length substantially equal to the height of such hoistway;

suspending said pair of rails in such hoistways;

securing a lower end adjacent region of each of said pair of rails to the walls of said hoistway;

suspending a plumb line adjacent each of said pair of rails;

determining and recording the positions of each said lower end adjacent region of each of said pair of rails relative to said adjacent plumb line by positioning and securing a first

member moveable along a first axis and a second member moveable along a second axis normal to said first axis;

utilizing said recorded relative positions to place vertically spaced apart upper regions of each of said pair of rails into said previously determined relative positions; and

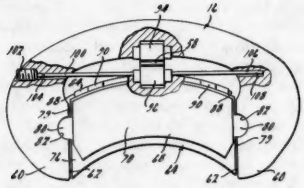
securing said upper regions of each of said pair of rails to the walls of said hoistway in said relative positions.

4,593,795

INCLINED DISC BRAKE ASSEMBLY

Frank T. Cox, Jr., Imperial Southgate Villa #111, Lakeland, Fla. 33803

Filed May 2, 1983, Ser. No. 490,522
Int. Cl.[4] F16D *55/04*
U.S. Cl. 188—71.3 **9 Claims**



1. A brake for a motor vehicle comprising:

a brake housing anchored to an outer end of an axle housing;

a rotor fixedly secured to a vehicle wheel, said wheel is mounted to an axle that is rotatably mounted within said axle housing;

said rotor having opposing first and second braking surfaces that are radially outwardly facing and canted with respect to the plane transverse to the axis of rotation of said rotor such that they diverge from each other forming a wedged shape annular channel therebetween;

said anchored housing having means for mounting first and second brake shoes for sliding motion in a direction parallel to the axis of rotation of said rotor;

said housing constructed to receive torque exerted on said brake shoes by said rotor;

said first and second brake shoes having canted outer frictional surfaces facing respective first and second surfaces of said rotor and having canted opposing inner surfaces;

an actuator wedge having canted opposite sides, said wedge interposed between said canted inner surfaces of said first and second brake shoes;

means for moving said wedge radially inwardly such that said canted sides of said wedge abut and slide against the inner surfaces of said first and second brake shoes to move said first and second brake shoes apart in opposite directions whereby said canted outer frictional surfaces engage said braking surfaces of said rotor; and

a spring wire being mounted at its ends to said brake housing and being operably connected to said wedge for returning said wedge to a radially outer position to allow said brake shoes to disengage from said rotor.

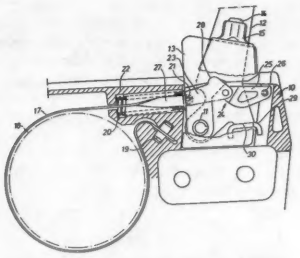
4,593,796

BRAKE OPERATING DEVICE

George N. Farquhar, Alingsås, Sweden, assignor to Emab Electrolux Motor Aktiebolag, Huskvarna, Sweden

Continuation of Ser. No. 490,332, May 2, 1983, abandoned. This application Jun. 7, 1985, Ser. No. 732,804
Claims priority, application Sweden, May 11, 1982, 8202949
Int. Cl.[4] F16D *51/00*
U.S. Cl. 188—77 R **6 Claims**

1. In a brake operating device for the brake of a motor chain saw, the chain saw having a determined longitudinal direction, a brake drum, a brake band around the brake drum, a toggle having a pair of legs having first ends coupled together to define a joint, one of said legs being pivoted to a free end of said brake band, and a spring biasing said toggle, whereby the toggle is switchable between a braking position and a free position in which positions said toggle has relaxed and pretensioned positions respectively; the improvement wherein said brake operating device further comprises an inertia mass pivotally mounted on a fixed pivot point for controlling the movement of said toggle upon sudden acceleration of said chain saw, said spring being positioned to pretension said band in said relaxed position of said toggle, said inertia mass being positioned to control said toggle to maintain said spring in a ready position said inertia mass engaging said toggle substantially at said joint on a point of said inertia mass substantially at its center of gravity, whereby pivotal movement of said inertia mass urges said toggle to its relaxed position, the center of gravity of said inertia mass being positioned within a sector of 25 degrees relative to said pivot point on either side of a line extending through said pivot point of said mass and perpendicular to said longitudinal direction, the other leg of said toggle joint being pivoted to a fixed point of said chain saw, the line interconnecting said stationary pivot and the pivot between said one leg and said brake band extending to form a tangent with said brake drum.

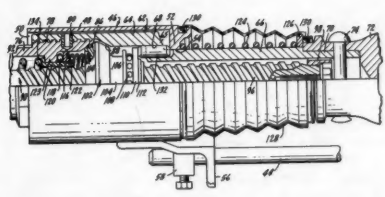


4,593,797

COMPRESSION TYPE RAILROAD BRAKE SLACK ADJUSTER

Eugene W. Schmitt, Lockport, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Jul. 16, 1984, Ser. No. 631,454
Int. Cl.[4] F16D *65/66*
U.S. Cl. 188—196 D **7 Claims**



1. A compression type slack adjuster for use in a railroad brake, the brake rigging being arranged such that during application of the brakes the slack adjuster is in compression, comprising:

a clutch housing assembly having first and second opposed clutch surfaces formed therein and a first clevis affixed to one end of the housing, the other end being open;

an adjusting screw assembly having a threaded end fitting telescopically in the open end of the clutch housing, the other end of the screw assembly having a second clevis affixed thereto;

a clutch disc rotatably mounted on the adjusting screw

threads and disposed between the first and second clutch surfaces;

a trigger housing surrounding at least a portion of the clutch housing and having a bracket attached thereto;

a main spring engaging the adjusting screw assembly and the clutch housing assembly, urging the first and second clevises apart;

a trigger spring bearing against the clutch housing and the trigger housing, urging the trigger housing and clutch housing apart;

a plurality of clutch pins slidably mounted in the clutch housing assembly and engageable between the trigger housing and clutch disc so as to transmit the trigger spring force to the clutch disc;

an actuator rod having a stop collar, the rod being connectable to the brake rigging and slidable in the bracket with the bracket between the stop collar and the brake rigging, the stop collar and bracket being engageable upon sufficient relative separation of the rod and trigger housing to compress the trigger spring and remove the trigger spring force from the clutch pins; and

a lockup spring disposed between the clutch housing and clutch disc to apply a force to the clutch opposite that applied by the trigger spring.

4,593,798

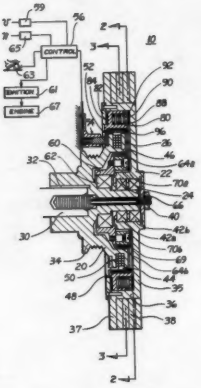
IDLE RESTART CLUTCHING SYSTEM

Kwang Yew, Chatham, Canada, assignor to Canadian Fram Limited, Chatham, Canada

Filed May 2, 1983, Ser. No. 490,710

Int. Cl.[4] B60K *9/04, 41/02;* **F16D** *27/02, 47/00*

U.S. Cl. 192—0.033 **8 Claims**



1. An idle restart clutching system for restarting an engine by transferring angular momentum to same comprising:

control means for generating a control signal for restarting an engine;

idle restart clutch means for storing angular momentum and in response to said control signal for transferring the stored angular momentum to a rotational member such as a crankshaft of the engine to restart same comprising:

a spool body adapted to rotationally engage the crankshaft;

momentum wheel means mounted to said spool body on bearing means for rotation thereabout, said momentum wheel means including a radially extending member, a wall and a retaining ring mounted to said wall remote from said member defining a cavity into which at least a portion of said spool body extends;

said spool body including a radially extending portion extending into said cavity, an annular slip ring adapted to engage a brush assembly for transmitting said control signal thereto, said extending portion defining a coil space for supporting an electric coil in communication with said slip ring;

momentum wheel driving means interposed said spool body and said momentum wheel means for rotating said momentum wheel means with said spool body including disengagement means for disengaging said momentum wheel means from said spool body at a determinable angular velocity; and

torque limiting clutch means comprising an annular first disc fitted within said cavity in surrounding relation to said extending portion of said spool body, the disc having a friction surface adapted to engage the interior of said retaining ring, an annular second disc having a second friction surface adapted to engage said momentum wheel, a plurality of clutching springs interposed said first and said second discs for urging said first friction surface and said second friction surface towards said retaining ring and said momentum wheel means respectively, a ferromagnetic band positioned between said first disc and said extending portion and at least partially surrounding said extending portion having one end pivotally mounted to said first disc and having a free end wherein said band is brought into electromagnetic engagement with said spool body to establish a mechanical link therebetween to transfer engergy from said momentum wheel to said spool body and crankshaft.

4,593,799

ONE WAY CLUTCH MECHANISM FOR BICYCLE FREEWHEEL HUB

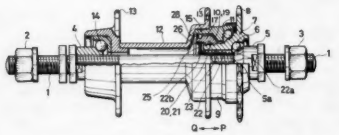
Nobuo Ozaki, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Mar. 7, 1984, Ser. No. 587,111

Claims priority, application Japan, Mar. 7, 1983, 58-37803

Int. Cl.[4] F16D *41/36*

U.S. Cl. 192—46 **9 Claims**



1. A ratchet type one way conical clutch mechanism for a bicycle freewheel hub, comprising

a driver having at least one sprocket thereon and relatively rotatable with respect to a stationary axle,

a hub shell relatively rotatable with respect to said axle and carrying an inward conical clutch face formed,

an internally threaded clutch member co-axially and relatively rotatably mounted on a threaded section of said driver so as to be movable axially back and forth on said threaded section,

said clutch member having an outward conical clutch face,

a disk which is mounted on said axle so as to be axially slidable on said axle within a limited range and which is disposed internally of said clutch member,

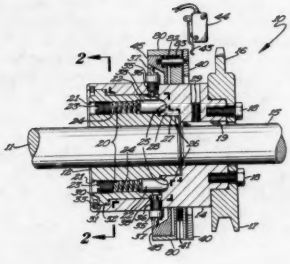
and a compression coil spring means co-axially mounted on said axle for cooperation with said disk so as to urge said clutch member axially inwardly for disengagement of said outward conical clutch face from said inward conical clutch face.

4,593,800

TORQUE RELEASE DRIVE CONNECTOR

Joseph M. Ness, Wayzata, and Lyle J. Gerads, Minnetonka, both of Minn., assignors to Helland Research & Engineering, Inc., Minneapolis, Minn.

Filed Feb. 22, 1983, Ser. No. 468,851
Int. Cl.[4] F16D *7/00, 43/20*
U.S. Cl. 192—56 R 1 Claim



1. A releasable torque clutch comprising:
(a) a rotatable driving element adapted for connection to a driving force;
(b) a first plurality of axial bores formed in said driving element;
(c) a rotatably driven element adapted for connection to a work transmitting element and having an inner face, said driven and driving elements being axially disposed, one within the other, and contained to prevent axial movement between the same;
(d) a first plurality of hemispherical indentations disposed equidistance from each other at the same radius in the inner face of said driven element;
(e) a second plurality of axial bores larger in diameter than, but aligned with said first plurality to form a shoulder where they intersect in said driving element and confronting said hemispherical indentations certain of said plurality of bores disposed circumferentially from mating with said plurality of indentations;
(f) a plurality of movable bullet shaped elements disposed within some of said second plurality of axial bores, each individually biased to engage certain of said plurality of hemispherical indentations as long as the torque applied to said driving element is less than the individual bias of said movable elements;
(g) a trigger mechanism having a first part formed on said driving element that is rotated to an actuated position and is a flat segment formed normal to each radius passing through said bores formed in said driving element; and
(h) a second part of said trigger mechanism secured to said driven element and communication with said first part and having a biased pin disposed along said radius passing through said bores, one end of which is in communication with said flat segments, said second part extending upon said first part moving to an actuated position.

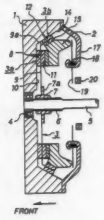
4,593,801

CLUTCH

Hiroshi Takeuchi, Osaka; Hirotaka Fukushima, Hirakata, and Hidekazu Majima, Yawata, all of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Jul. 12, 1984, Ser. No. 630,042
Claims priority, application Japan, Jul. 18, 1983, 58-131652
Int. Cl.[4] F16D *13/24, 13/66*
U.S. Cl. 192—70.15 3 Claims

1. A clutch interposing a clutch disc between driving flywheel and a pressure plate characterized in that the clutch disc is composed of a first area substantially perpendicular to the driving axis of said flywheel and having friction surface on the opposite sides thereof and an outer peripheral cone-shaped area radially outward from said first area and having friction



surfaces on the opposite sides thereof, said cone-shaped area being divided into plural pieces having different distances from the clutch center so that an outer side piece is provided with a gradual larger inclination angle than an inner side piece.

4,593,802

FRICTION MATERIAL

Donald M. Danko, Jr., Broadview Heights, Ohio, assignor to The S. K. Wellman Company, Bedford, Ohio

Filed Oct. 11, 1983, Ser. No. 540,445
Int. Cl.[4] F16D *69/02;* C09K *3/14*
U.S. Cl. 192—107 M 15 Claims

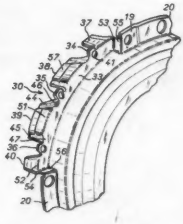
1. A friction facing material operably engageable with an opposing surface material in the presence of a transmission fluid, said friction facing material comprising a sintered matrix of a fluorocarbon resin binder containing more than 35% by weight elemental carbon distributed therein as a particulate material.

4,593,803

CLUTCH MECHANISM

Carlo Valier, Turin, Italy, assignor to Valeo, Paris, France

Filed Jun. 19, 1984, Ser. No. 622,173
Claims priority, application France, Jun. 22, 1983, 83 10310
Int. Cl.[4] F16D *13/60*
U.S. Cl. 192—112 11 Claims



1. A clutch mechanism especially for a motor vehicle, said clutch mechanism comprising a one-piece stamped cover, a pressure plate, axially acting elastic means biasing said pressure plate away from said cover and permitting axial movement of said pressure plate relative to said cover and rotational movement of said pressure plate with said cover, said cover having along a periphery thereof in circumferentially alternating relation coupling rim portions and fastening rim portions, means for coupling said pressure plate to said cover being secured to said cover in said coupling rim portions, said fastening rim portions having circumferentially alternating axially extending skirt portions and radial lugs, said skirt portions depending from associated ones of said fastening rim portions and said lugs radially extending from associated ones of said fastening

rim portions, said lugs accommodating means for fastening said cover to a reaction plate.

4,593,804

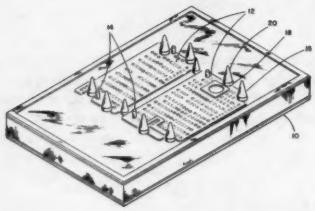
APPARATUS FOR GUIDING A CIRCUIT BOARD ONTO A TESTING LOCATION ON A TEST FIXTURE

Graeme R. Kinsey, Clayton, and William M. Riesenberg, Walnut Creek, both of Calif., assignors to Zehntel, Inc., Walnut Creek, Calif.

Continuation of Ser. No. 573,413, Jan. 24, 1984, abandoned. This application Oct. 21, 1985, Ser. No. 789,923

Int. Cl.[4] B65G *47/24*

U.S. Cl. 193—41 **6 Claims**



1. Apparatus for guiding a circuit board which is free to move in two or more degrees of freedom onto a testing location on a test fixture, comprising:

at least one substantially rigid, substantially smooth guide pin adapted to engage the circuit board so as to guide the circuit board onto the testing location, each guide pin is vertical to the plane of the testing location for a predetermined height, and at least one substantially rigid, substantially smooth guide located outside and near to the circumference of the testing location, each guide having a surface which faces the testing location and is vertical to the plane of the testing location for a height approximately equal to the height of the guide pins and thereabove is sloped upwards and outwards away from the testing location, a base of this surface being so located that, when the corresponding edge of the circuit board is lying against this base, the circuit board is correctly positioned so as to engage the guide pin.

4,593,805

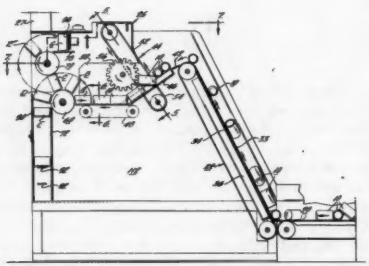
SYSTEM FOR SORTING CONTAINERS

Herbert C. Huddle, Napoleon, Ohio, assignor to Campbell Soup Company, Camden, N.J.

Filed Nov. 15, 1984, Ser. No. 671,559

Int. Cl.[4] B65G *47/24*

U.S. Cl. 198—381 **13 Claims**



11. A system for receiving from a jumble bin randomly oriented cylindrical cans of magnetically attractable material each having an open end and a closed end and a length greater than its diameter, and for forming therefrom a common set of containers all oriented in the same direction, comprising:

first conveyor means for receiving and transporting said cans from said jumble box;

can aligning means for receiving said cans from said first conveyor means and for forming said cans into an end-on aligned train, said aligning means comprising chute means for passing cans only in said aligned train;

a rotating magnetic pick-up wheel positioned to receive successive leading cans in said train, said cans being fed to said pick-up wheel end-on so that the leading end of each can contacts the exterior peripheral edge of said pick-up wheel and is magnetically attracted to and carried by said pick-up wheel as it rotates;

a magnetic sorter wheel rotatable oppositely to the direction of rotation of said pick-up wheel, with its periphery spaced from that of said pick-up wheel by a distance slightly greater than the lengths of said cans, whereby those cans having their bottom ends adjacent said sorter wheel are attracted to and carried by said sorter wheel as it rotates and those having their closed ends adjacent said pick-up wheel remain thereon and are carried by it as it continues to rotate;

means for separating said cans from said sorter wheel to form a first set of cans all oriented in the same direction;

means for separating said cans from said pickup wheel after they pass said sorter wheel to form a second set of cans all oriented in the same direction; and

means for merging said first and second sets of cans to form said common set in which all cans are oriented in the same direction.

4,593,806

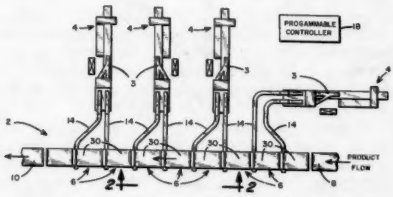
MULTIPLE TRANSPOSITOR CONVEYOR SYSTEM

Gale R. Tappe, New Richmond, and Wayne D. Sommer, Amery, both of Wis., assignors to Doboy Packaging Machinery, Inc., New Richmond, Wis.

Filed Oct. 7, 1983, Ser. No. 539,931

Int. Cl.[4] B65G *47/08, 47/30, 47/71, 15/24*

U.S. Cl. 198—369 **7 Claims**



1. A conveyor system for transporting products from a source a supply to a plurality of separate work stations in a coordinated fashion to equalize the work to be done at each such work station, said conveyor system comprising in combination:

(a) an elongated supply conveyor having infeed conveyor means for receiving product from said source of supply and a plurality of dual transpositor means disposed in tandem relationship to one another, each of said dual transpositor means including,

1. a primary endless belt deployed about a first plurality of rollers to define a first generally horizontal flight aligned with said infeed conveyor, one of said rollers in said first plurality of rollers defining said horizontal flight being horizontally retractable to shorten said first horizontal flight;

2. a secondary endless belt deployed about a second plurality of rollers to define a second generally horizontal flight in a plane below said first generally horizontal

flight, one of said rollers in said second plurality of rollers defining said second generally horizontal flight being retractable in a direction opposite from said one of said rollers in said first plurality of rollers;

3. said first generally horizontal flight of one of said plurality of dual transpositor means being disposed above said second generally horizontal flight of an adjacent one of said plurality of dual transpositor means; and

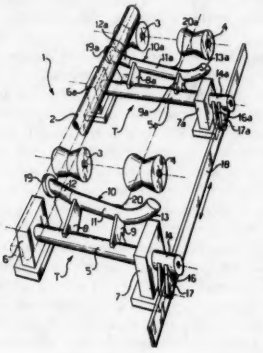
(b) a plurality of cross-feed conveyors, each such cross-feed conveyor comprising an endless belt deployed about a plurality of rollers to define a third generally horizontal flight extending transversely to said elongated supply conveyor, said third flight having one end thereof positioned beneath said second generally horizontal flight and the other end at one of said plurality of work stations.

4,593,807

EQUIPMENT FOR THE LATERAL TRANSFERENCE OF PIPES

Filippo Cattaneo, Milan, and Agostino Perrone, Limito, both of Italy, assignors to Innse Innocenti Santeustacchio S.p.A., Milan, Italy

Filed Jan. 11, 1985, Ser. No. 690,530
Claims priority, application Italy, Jan. 13, 1984, 19155 A/84
Int. Cl.⁴ B65G *47/26*
U.S. Cl. 198—457 **2 Claims**



1. Equipment for the lateral transference of pipes from one roller track to an adjacent parallel roller track, comprising at least two identical transfer units spaced apart in the direction of the said roller tracks, wherein each said unit comprises

a horizontal shaft extending perpendicularly to the roller tracks and below them,

a pipe chute supported cantilever-fashion by said shaft and extending transversely to the said roller tracks, said pipe chute having: an intermediate rectilinear portion converging with said horizontal shaft towards the roller track onto which a pipe is to be transferred; a curvilinear end portion with a convex part turned towards the shaft and extending from one end of said intermediate portion and across the said roller track to which the said pipe is to be transferred, and an end portion directed away from the said shaft and extending from the other end of said intermediate portion and across the roller track from which the said pipe is to be transferred, and

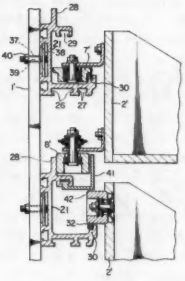
means for moving the said pipe chute angularly about the axis of said shaft between a lowered position in which it is completely below said roller tracks and a raised position in which it is completely above them.

4,593,808

APPARATUS FOR ROTATING AND DRIVING HORIZONTAL RACK-TYPE CONVEYORS

Hirokazu Kondo, and Asso Maruyama, both of Osaka, Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Aug. 16, 1984, Ser. No. 641,478
Int. Cl.⁴ B65G *37/00*
U.S. Cl. 198—570 **10 Claims**



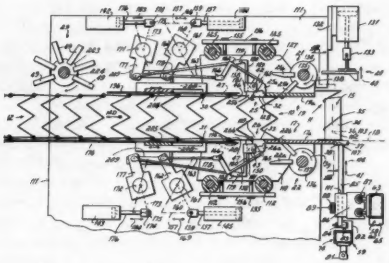
1. An apparatus for rotating and driving a horizontal rack-type conveyor comprising: an upper guide rail arranged in a horizontal closed loop and having a vertical rail surface facing inwardly of said loop, a lower guide rail formed separately from said upper guide rail and arranged to form a closed horizontal loop, said lower guide rail having a vertical rail surface facing outwardly of said loop, a plurality of racks connected side-by-side to form an endless rack series, each of said racks being provided at its rear side with an upper vertical roller adapted to roll on the inwardly-facing vertical rail surface of said upper guide rail, and a lower vertical roller adapted to roll on the outwardly-facing vertical rail surface of said lower guide rail, at least a selected one of said guide rail surfaces having a free top edge, the roller engaging said selected surface having a flange projecting from the rail-engaging surface of the roller to form a corner therebetween adapted to roll on the free top edge of the selected rail surface.

4,593,809

COIL SPRING ASSEMBLY MACHINE

Henry Zapletal, Carthage, Mo.; Horst F. Wentzek, and George M. Chembakaffery, both of Kenosha, Wis., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Division of Ser. No. 300,995, Sep. 10, 1981, Pat. No. 4,492,298. This application May 17, 1984, Ser. No. 611,582
Int. Cl.⁴ B65G *29/00*
U.S. Cl. 198—624 **10 Claims**



1. A machine for advancing a group of coil springs from a first location to a second location, said machine being used to

fabricate a coil spring assembly from said coil springs, said machine comprising

a support platen, said coil springs being positioned on said platen in desired group configuration with said springs' axes being generally normal to said platen, and

rotatable first and second transfer fingers movable through slots in said platen and adapted to cooperate with at least one of the top end loop and the bottom end loop of said coil springs within said group, said first transfer finger functioning to extend through said one of said top end loop and bottom end loop of said coil springs and to initially pull said coil springs from the inside of said coils away from said first location toward said second location, and said second transfer finger functioning to subsequently engage and push said coil springs from the outside of said coils out of engagement with said first transfer finger and away from said first location toward said second location, said first transfer finger being still engaged with said inside of said coils upon engagement of said second transfer fingers with said outside of said coils, and said second transfer finger being operable to push said coils away from said first transfer finger before said first transfer finger moves through said slot in said platen so as to prevent said first transfer finger from pinching said coils between said first transfer finger and said platen.

4,593,810

MECHANICAL HANDLING APPARATUS

Kenneth Cook, Anglesey, United Kingdom, assignor to Hydraroll Limited, United Kingdom

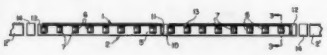
PCT No. PCT/GB82/00259, § 371 Date Apr. 21, 1983, § 102(e) Date Apr. 21, 1983, PCT Pub. No. WO83/00680, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 27, 1982, Ser. No. 502,015

Claims priority, application United Kingdom, Aug. 27, 1981, 8126132

Int. Cl.⁴ B60P *1/52*; B65G *13/02*

U.S. Cl. 198—781 **5 Claims**



1. Mechanical handling apparatus for the movement of loads over a support surface comprising a conveyor which includes freely rotatable means and inflatable means for supporting said rotatable means, said rotatable means and supporting means being positioned relative to said support surface so that said supporting means may be inflated to raise portions of said rotatable means above said support surface for rendering a load mobile on that surface and so that said supporting means may be deflated to retract said portions beneath said support surface for rendering said load immobile, the handling apparatus further comprising load drive means spaced from said rotatable means, said load drive means having surface means engageable with said load for moving said load along said conveyor and cooperable with said load for slipping relative to said load when said load, while drivingly engaged by said surface means, encounters an obstacle which prevents movement of the load along the conveyor; power means for driving said load drive means; and means independent of said inflatable means for raising said load drive means independently of said rotatable means relative to said support surface to bring said surface means of said load drive means into driving engagement with said load and for lowering said load drive means independently of said rotatable means relative to said support surface to retract said surface means of said load drive means out of driving engagement with said load.

4,593,811

DEVICE IN A ROTATING SHAFT SUPPORTING BEARING ELEMENT

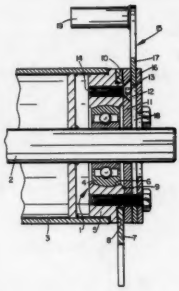
Lars Sirefelt, Sisjövägen 321, S-436 00 Askim, Sweden

PCT No. PCT/SE82/00387, § 371 Date Jul. 12, 1984, § 102(e) Date Jul. 12, 1984, PCT Pub. No. WO84/01986, PCT Pub. Date May 24, 1984

PCT Filed Nov. 15, 1982, Ser. No. 631,551

Int. Cl.⁴ B65G *39/10*

U.S. Cl. 198—842 **7 Claims**



1. For use in a machine member of a machine having a rotatable shaft, a bearing element with a bearing housing, and a locking ring having a first set of screw holes through which pass a first set of screws to be anchored to the bearing element with the machine member sandwiched therebetween, a device for attaching an element to said machine, said device comprising: at least one retainer element having an attachment plate formed with a substantially circular aperture therein, and retainer means secured to the attachment plate to fasten a member associated with the machine, and a clamping ring formed with at least three screw holes and a corresponding number of screws forming a second set of screws, said locking ring having a second set of screw holes through which said second set of screws may pass and be secured in the bearing housing, said second set of screws being arranged to extend through the aperture in the attachment plate and being so positioned that said screws of said second set, while cooperating with the periphery of said aperture and with the locking ring and the clamping ring, guide the retainer element radially as well as axially, said retainer element when the clamping ring is somewhat loosened, being adapted to be turned and set in a selected rotational position relative to the rotating shaft and, when the clamping ring is tightened, to be secured in the selected position by tightening of said second set of screws.

4,593,812

NECKTIE TRAVEL CASE

Richard F. Dillingham, 4309 Shady Hill, Dallas, Tex. 75229

Filed Jul. 26, 1984, Ser. No. 634,623

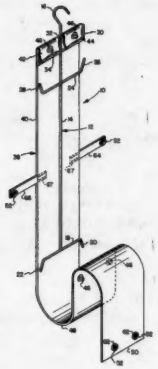
Int. Cl.⁴ A47G *25/74*; B65D *85/18*

U.S. Cl. 206—292 **10 Claims**

10. A necktie case comprising:

a frame including an elongated column member having a hook portion formed at one end, a first necktie support member on said column member adjacent to said hook portion, and a second support member generally parallel to said first support member at the end of said column member opposite said first support member; said first and second support members being rigidly secured to said column member in a fixed position with each other and each having distal end portions extending away from the other support member, to thereby define a form about which neckties may be engagingly folded and secured against slipping off said support members; and

a flexible cover secured to said frame at one end between said hook portion and said first support member and extending longitudinally along said column member, said cover being of a length sufficient to be engagingly folded around said second support member and to be secured



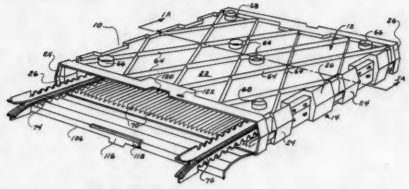
relative to said frame at the opposite end of said cover to enclose said first and second support members between adjacent flaps formed by said cover and so as to engage at said second support member and enclose a necktie folded about said first and second support members.

4,593,813

PROTECTIVE CONTAINER FOR ASSEMBLED PRINTED CIRCUIT BOARDS

Stephen S. Powel, 4305 Tallwood Dr., Greensboro, N.C. 27410

Filed Apr. 8, 1985, Ser. No. 721,051
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 **21 Claims**



1. An electrostatic dissipative storage and shipping container for printed circuit boards containing sensitive micro-electronic components thereon, said container comprising:

(a) a rectangular housing having a top, bottom and side walls with an opening therethrough from front to rear;

(b) a plurality of tracks in said top and bottom walls extending in a direction from front to rear thereof;

(c) at least one pair of upstanding longitudinally extending partitions mounted in horizontally spaced relation between corresponding tracks in said top and bottom walls;

(d) said partitions having opposed longitudinal channels in the walls thereof between which are supported said printed circuit boards;

(e) a hinged door selectively movable between an opened and closed position at least at the the front of said rectangular tube;

(f) at least said housing being formed of a conductive polymeric material;

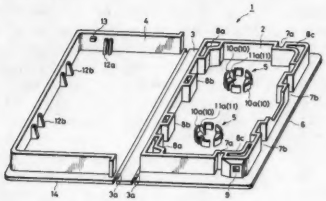
(g) whereby said printed circuit boards are suspended without engagement of the type and bottom walls within a Faraday Cage.

4,593,814

MAGNETIC TAPE CASSETTE STORING CASE

Hideo Hagiwara, Aichi, and Hiroshi Matsumoto, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 25, 1985, Ser. No. 694,735
Claims priority, application Japan, Jan. 25, 1984, 59-9445[U]
Int. Cl.[4] B65D *85/07*
U.S. Cl. 206—387 **4 Claims**



1. A magnetic tape cassette storage case comprising a box-shaped body for receiving a magnetic tape cassette and a cover for opening and closing said box-shaped body, wherein the improvement comprises:

said body has engaging parts on an inner surface of a bottom thereof which are shaped to engage with corresponding reel hub holes of said magnetic tape cassette, and wherein each of said engaging parts comprises:

rotation preventing means in the form of a discontinuous ring comprising a plurality of protrusions extending from said inner surface of said bottom of said body inwardly of said case; and

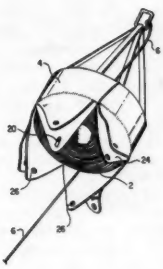
positioning means arranged inside said rotation preventing means comprising at least one protrusion extending from said inner surface of said bottom of said body inwardly of said case.

4,593,815

DEPLOYABLE COILED ROPE

David A. Wright, Fort Erie, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Feb. 20, 1985, Ser. No. 703,528
Claims priority, application Canada, Apr. 5, 1984, 451377
Int. Cl.[4] B65D *85/04*
U.S. Cl. 206—389 **12 Claims**



1. A coiled rope, the rope being wound starting from a first position in sequential, adjacent, planar circular layers of ap-

proximately similar diameters, to a second outer portion of the rope forming a coiled rope structure having flat ends, each layer consisting of a plurality of coils of rope of increasing size commencing from a first coil, the rope passing from the external coil in each layer transversely across that layer to commence the first coil in the next adjacent layer, adjacent coils of rope in each layer and adjacent layers of rope being releasably adhered to each other by contact cement so that the rope will normally remain securely coiled, but when forcefully uncoiled, will provide rapid yet controlled deployment of the rope, the rope when being unwound coming off from one of the flat sides one layer at a time.

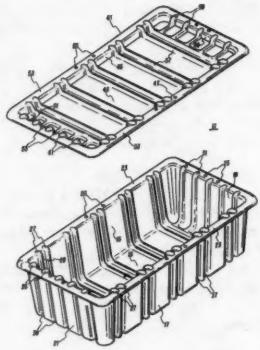
9. A coiled rope contoured in a rope deployment package, the rope being wound starting from a first portion of sequential, adjacent, planar circular layers of approximately similar diameters, to a second outer portion of the rope each layer consisting of a plurality of coils of rope of increasing size commencing from a first coil, forming a coiled rope structure having flat ends, adjacent coils of rope in each layer and adjacent layers of rope being releasably adhered to each other by contact cement so that the rope will normally remain securely coiled, but when forcefully uncoiled, will provide rapid yet controlled deployment of the rope, the rope when being unwound coming off from one of the flat sides one layer at a time, the rope deployment package comprising a bag having releasably securable flaps which, when open, expose the end of the rope structure adjacent the second portion of the rope.

4,593,816

CONTAINER FOR STORING AND TRANSPORTING LETTER MAIL AND OTHER FLAT ARTICLES

Keith A. Langenbeck, 3112 Purdue St., Dallas, Tex. 75225

Filed Sep. 3, 1985, Ser. No. 771,825
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—425 **31 Claims**



1. A container for storing relatively flat articles such as letters and the like, comprising:

a bottom member and four walls extending upwardly from said bottom member and interconnected to form an enclosure for receiving said articles, said bottom member having a width greater than the respective lengths of the articles to be stored in said container and a length which is substantially greater than the respective thicknesses of said articles;

a first set of rib members dispoesd at respective predetermined positions on said container and extending vertically along substantially the entire height of a first one of said walls, horizontally across said bottom member and vertically along substantially the entire height of a second one of said walls oppositely positioned from said first wall;

a second set of rib members disposed at respective predetermined positions on said container and extending vertically along substantially the entire height of a third wall and partially inwardly along said bottom member and terminating at respective intersections on said bottom member with a particular one of said first set of rib members which is closest to said third wall;

a third set of rib members disposed at respective predetermined positions on said container and extending vertically along substantially the entire height of a fourth wall oppositely positioned from said third wall and partially inwardly along said bottom member, said third set of rib members terminating at respective intersections on said bottom member with a particular one of said dfirst set of rib members which is closest to said fourth wall; and

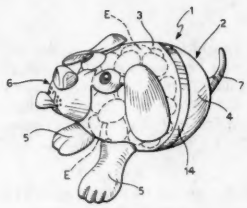
a rim member extending horizontally outward from said four walls around the permimeter of said container.

4,593,817

CONTAINER FOR FOOD PRODUCTS, PARTICULARLY SWEET PRODUCTS, USABLE AS A MONEY BOX

Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy

Filed Apr. 10, 1985, Ser. No. 721,763
Claims priority, application Italy, May 18, 1984, 5339/84[U]
Int. Cl.[4] B65D *69/00*; A63H *3/00*
U.S. Cl. 206—457 **6 Claims**



1. A container for food products, which can be used for keeping money and similar objects after consumption of the products, comprising:

a hollow casing for receiving the food products, the hollow casing having a zoomorphic appearance and being constituted by two hollow trough-shaped bodies which can be joined together releasably in a frontal mating position generally transversely along the hollow casing, the trough-shaped bodies having complementary free edges forming a zone of connection, at least one of the free edges defining a notch which, together with the free ends of the other trough-shaped body, forms a transverse slot in the wall of the casing when the two bodies are joined together,

a partitioning separator member enclosed within the casing fitted releasably within the casing to divide the casing into portions defining two chambers, one of said chambers being intended to receive the food products, and

a laminar sealing member applied removably to the casing to close the slot, the sealing member being in the form of an annular band which can be wrapped around the hollow casing in the zone of connection between the two trough-shaped bodies.

4,593,818

CAN STACKER

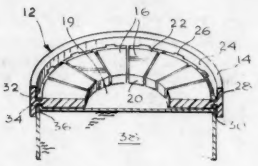
Roger B. Schenkman, 458 Sycamore Rd., Santa Monica, Calif. 90402

Filed Apr. 29, 1985, Ser. No. 728,473
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—503 **15 Claims**

1. An improved can stacker, said can stacker comprising a unitary structure in the form of an openable, split, flexible, resilient ring, said ring including:

(a) a finned annular split rim;

(b) a plurality of separate, spaced, generally horizontal fin portions integrally formed as parts of said rim and adapted to support a can and extending radially inwardly from said rim on opposite sides of said split, said fin portions being connected to the inner margin of said rim and having annular recesses at the top and bottom of the outer periphery thereof



to form with said rim upper and lower can rim-receiving grooves;

said stacker being openable to engage the rims of a pair of cans to be vertically stacked, so as to establish and maintain the vertical alignment of said cans and to physically support the upper one of said pair of cans on the fin portions resting on the lower one of said cans.

4,593,819

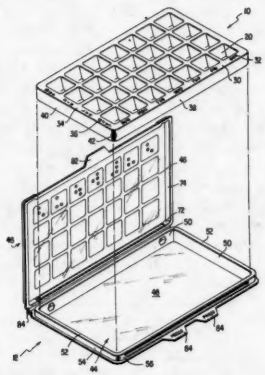
COVERED PILL TRAY AND SUPPORT THEREFOR

Malcolm Will, 3125 Woodbridge Ave., Edison, N.J. 08837

Filed May 29, 1984, Ser. No. 614,825

Int. Cl.[4] B65D *1/36, 85/56, 85/62, 21/02*

U.S. Cl. 206—538 **11 Claims**



1. A covered pill tray and support assembly comprising:

a tray of rectangular configuration having a plurality of open-topped compartments for the reception of individual dosages of pills and the like;

a case having a base portion adapted to receive said tray, a cover adapted to overly said tray, a hinge integral with said base portion and said cover and connecting the same along one edge thereof, and latch means for releasably holding said cover in closed position on said base portion;

a support base having upwardly extending front, rear and side walls defining a region for reception of said tray and two additional regions for the reception of medication containers, said additional regions being located laterally of said firstmentioned region and being defined by said side walls, lateral extensions of said front and rear walls and further side walls; and

cooperating means on said case and said supporting base for releasably retaining said tray and case in said supporting base.

4,593,820

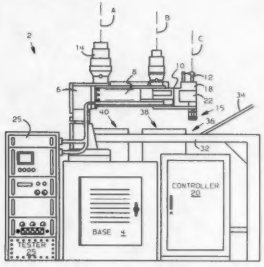
ROBOTIC, IN-TRANSIT, DEVICE TESTER/SORTER

Charles H. Antonie, Manassas, and Thomas K. Murray, III, Midland, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1984, Ser. No. 594,173

Int. Cl.[4] B07C *5/344;* **G05B** *23/02;* **B23Q** *15/00*

U.S. Cl. 209—573 **22 Claims**



1. An in-transit electrical device tester and sorter, comprising:

a holding mechanism mounted on a robot arm for selectively holding an electrical device to be tested;

a test head mounted on said robot arm independent of and proximate to said holding mechanism, for selectively making electrical contact with said electrical device;

a tester operatively connected to said test head for providing test signals to said test head for testing said electrical device and for receiving test result signals from said electrical device in response to said test signals;

a robot arm control mechanism having an input connected to said tester and an output connected to said robot arm, for controlling the holding of said electrical device by said holding mechanism and controlling the translation of said arm to a first destination or a second destination in response to an output from said tester indicating whether said electrical device has a first test result state or a second test result state, respectively;

whereby said electrical device can be tested during the translation of said device from a pick-up point to either said first destination or said second destination.

4,593,821

BELT SEPARATOR FOR BLOW MOLDING PARTS

Paul L. Brulé, Plainwell, Mich., assignor to LaRos Equipment Company, Inc., Portage, Mich.

Filed Apr. 25, 1985, Ser. No. 726,861

Int. Cl.[4] B07B *1/15, 1/10, 13/04*

U.S. Cl. 209—620 **16 Claims**

1. A separator apparatus for effecting separation of a mixture of parts, such as blow-molded plastic parts, comprising:

a housing means;

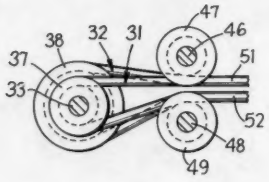
elongated separator belt means movably mounted on said housing means for effecting separation of a mixture of parts by permitting first parts to fall therethrough while supporting second parts and transporting them to a discharge location;

said separator belt means including at least two endless belts movably supported on the housing means, said belts having elongated upper belt reaches which extend approximately horizontally of the housing means, said upper belt reaches extending in substantially parallel and adjacent side-by-side relationship and being provided with a small

predetermined clearance space therebetween through which said first parts can pass, each said belt also including a substantially horizontally elongated lower belt reach which extends substantially parallel with and vertically spaced downwardly below the respective upper belt reach;

guide means aasociated with said housing means for funneling a mixture of said parts into a region directly above said upper belt reaches;

drive means for moving said belts relative to said housing means and for causing one said belt to move at a speed



which is at least slightly greater than the speed of the other belt, said drive means including drive pulleys engaging said belts adjacent one end thereof and end idler pulleys engaging said belts adjacent the other end thereof; and

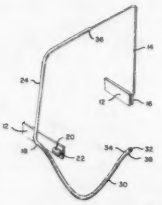
idler pulley means associated with each said belt for maintaining the upper and lower belt reaches of the respective belts in parallel but closely adjacent vertically spaced relationship so that the respective upper and lower belt reaches are vertically spaced apart by a small distance which is only a small fraction of the diameters of the drive and end idler pulleys.

4,593,822

WIRE RACK WITH REMOVABLE REPLACEABLE SLEEVES

Gerald L. Yeaney, and Roy S. Klein, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Jul. 9, 1984, Ser. No. 629,230
Int. Cl.[4] A47G *19/08*
U.S. Cl. 211—41 **5 Claims**



1. A device for holding items in apparatus for washing, washing-sterilizing or sterilizing comprising:

a rack having a frame and a plurality of wire components arranged to support the items, each of said components having at least one end releasably secured to said frame; and

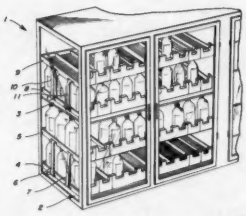
a plurality of heat and moisture resistant sleeves, one of said sleeves being so slidably disposed on each of said wire components that each of said sleeves so encloses the one of said wire components on which said sleeve is disposed that said plurality of sleeves can cushion the items in said rack against mechanical abuse from said wire components, each of said sleeves being continuous for the length of the one of said wire components on which said sleeve is disposed and being sufficiently flexible to substanially conform to the configuration of the one of said wire components on which said sleeve is disposed, and each of said sleeves being removable from the one of said wire components for selective replacement thereof by releasing said releasably secured end and sliding said sleeve over said released end.

4,593,823

GRAVITY FEED DISPLAY DEVICE

Jane S. Fershko, Marietta, Ga., and Robert W. Lackey, Hickory, N.C., assignors to The Mead Corporation, Dayton, Ohio

Filed Dec. 5, 1983, Ser. No. 557,851
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—49.1 **2 Claims**



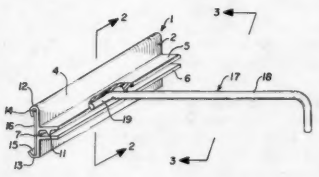
1. A gravity feed display device comprising a pair of shelf units arranged to be inclined so as to feed articles in the direction of inclination thereof and adapted for alternate disposition one above or below the other, a plurality of transverse guide passages formed on the bottom surface of each of sid shelf units, a plurality of support brackets each having a vertical part and an upper and a lower horizontal part, said support brackets being arranged with their lower horizontal parts disposed within the guide pasages of a lower shelf unit respectively and with their upper horizontal parts disposed within the guide passages of an upper shelf unit respectively so as to provide support therefor, alternate guide passages being formed in each of said shelf units for each one of said brackets and each bracket being associated with the rear one of each of said alternate guide passges in the lower one of said shelf units and with the front one of each of said alternate guide passages in the upper one of said shelf units so as to enhance access to articles at the front of the lower one of said shelf units without affecting the inclined attitude of said shelf units or the interchangeability thereof.

4,593,824

TAG HOLDER

William Pfeifer, Springdale, Pa., assignor to Armstrong Store Fixture Corporation, Pittsburgh, Pa.

Filed Dec. 14, 1984, Ser. No. 681,654
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—57.1 **9 Claims**



1. A tag holder adapted for use in connection with a support rod having a shaft portion and an end portion extending later-

ally from the end of the shaft portion; said tag holder comprising:

a resilient planar member having a front face and a rear face;

a pair of parallel flanges integral with and projecting transversely from the rear face of said planar member and extending across a substantial portion of the width of said rear face; and

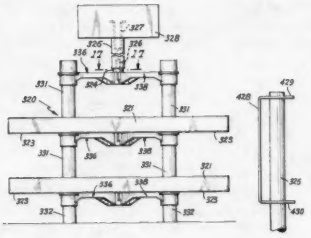
an integral rib projecting from at least one flange toward the other flange along a substantial portion of the length of said one flange and terminating in a free edge, said rib defining a notch therein extending from said free edge toward said one flange, said flanges being spaced apart, the rib being spaced from the rear face of the planar member, and said notch being sized such that, said flanges may be spread apart to snap said rib over the end portion of the rod with the shaft passing through the notch to snugly grip the end portion of the support rod between the flanges and between the rib and the rear face of the planar member, said flanges projecting outwardly from the rear face of said planar member beyond said rib such that with said tag holder engaging the end portion of the rod, the portions of said flanges which project outwardly beyond said rib engage the top and bottom of said shaft protion of the rod to prevent rotation of the tag holder about the end portion of the rod.

4,593,825

ADJUSTABLE KNOCKDOWN TRAY ASSEMBLY

James Hepp, 5 Fairview La., Glen Cove, N.Y. 11542

Filed Jun. 7, 1985, Ser. No. 742,415
Int. Cl.[4] A47F *3/14*
U.S. Cl. 211—126 **7 Claims**



1. A knockdown assembly adapted for storage and for display comprising:

a generally rectangular paperboard or cardboard tray having front and back walls and being made of a one-piece blank which is free from fastening elements having four uniformly spaced apart, cut-out circular portions adjacent the front and back walls thereof, the four cut-out portions being spaced apart to receive a tubular post at each cut-out portion and to receive a double socket on identical cross arms below the floor of the tray, the cross arms forming diagonal distances between the cut-out circular portions which are the same;

a tubular post at each cut-out circular portion;

a tray cross-arm support structure consisting of two inverted U-channel members each of the same length which are pivoted at their centers, one of said two channel arms having a pin and the other having a boss and each of said U-channel arms having a double socket at the corner into which said tubular post is fitted thereby adapting the tray cross-arm support structure to support the bottom of the tray and support any load placed on the tray;

said double socket which is provided at each corner of the two U-channel arms being adapted to receive at the upper end and at the lower end said tubular post to support in spaced apart relation a plurality of trays of the assembly;

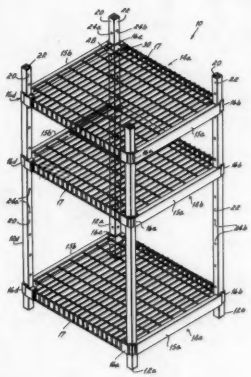
said pin pivot member being provided at the center of a lower U-channel arm and having an elevation which is ½ of the elevation of the boss member which is provided in the other of said two channel arms thereby contributing to a stable pivotal interconnection at the pin and the boss and said U-channel member being provided with indented side and top portions near the center pivot location where the pin and boss engage.

4,593,826

DISPLAY RACK WITH IMPROVED SHELF MOUNTS

Rafael T. Bustos, Alpharetta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Sep. 27, 1984, Ser. No. 655,329
Int. Cl.[4] A47B *47/00*
U.S. Cl. 211—187 **3 Claims**



1. An adjustable display rack comprising:

a shelf having a sleeve element mounted at each corner;

corner posts for supporting said shelf, each of said corner posts being adapted to extend through said sleeve elements of said shelf;

an insert assembly adapted to releasably mount to each of said corner posts, said insert assembhly including a first wedge element and a second wedge element each having top, bottom and side edges, said first and second wedge elements each having a lip formed on a side edge thereof, said first and second wedge elements increasing in cross section from said top edge to said bottom edge, one of said first and second wedge elements having a tongue extending laterally outwardly from one of said side edges, the other of said first and second wedge elements having a groove formed therein, said tongue being adapted to snap-fit within said groove to releasably connect said first and second wedge elements generally perpendicularly to one another;

locating means for locating said insert assembly along said corner post, said locating means including a pair of spaced dimples formed in said corner post, and a projection extending outwardly from each of said first and second wedge elements of said insert assembly, said projections of said wedge elements being adapted to seat within said dimples formed in said corner post for locating said insert assembly along said corner post;

said lips of said wedge elements engaging said corner posts and said projections of said wedge elements seating within said dimples formed in said corner posts to releasably secure said insert assembly to said corner posts such that said top edge of said first and second wedge elements is disposed vertically above said bottom edge thereof;

said insert assemblies being adapted to wedge between said sleeve element at each corner of said shelf and said corner

posts for supporting said shelf along said corner posts, said insert assembly preventing downward movement of said shelf along said corner posts while permitting said shelf to be lifted vertically upwardly from said insert assembly along said corner posts for repositioning said shelf.

4,593,827

RAILWAY CAR DRAWBAR CONNECTION WITH GUIDED SLACK ADJUSTING WEDGES

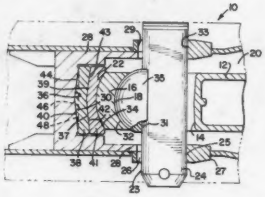
Russell G. Altherr, Munster, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 15, 1983, Ser. No. 561,873

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.[4] B61G *9/00*

U.S. Cl. 213—50 **3 Claims**



1. In a railway coupler drawbar arrangement including a drawbar having an elongated shank portion, and a convex butt end received within a center sill and held therein by a key extending through a slot in said shank, the improvement comprising:

a pocket casting with a generally flat inclined, rear wall located within the center sill,

a follower block located within said pocket casting said follower block having a front concave surface for abutting the convex butt end of said drawbar and a rear surface comprising two generally flat surfaces joined at a central vertical axis to form a generally convex surface,

and a wedge shaped shim having a generally flat inclined rear surface abutting said rear wall of said pocket, and a front surface comprising two generally flat surfaces joined at a central vertical axis to form a generally concave surface complementary to the said generally convex rear surface of said follower block and abutting said rear surface of said follower block.

4,593,828

ROTARY RAILROAD CAR F COUPLER

Richard M. Hanula, 5012 N. Barton Rd., Lyndhurst, Ohio 44124, and Karl J. Jwuc, 352 Whittlesey Dr., Tallmadge, Ohio 44278

Division of Ser. No. 322,217, Nov. 17, 1981, Pat. No. 4,428,489. This application Dec. 27, 1983, Ser. No. 565,899

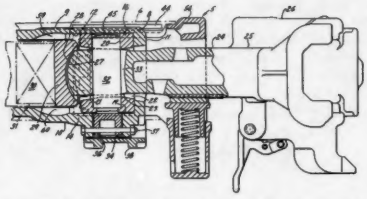
Int. Cl.[4] B61G *9/00*

U.S. Cl. 213—62 A **6 Claims**

1. A rotary railroad coupler assembly mounted within an AAR standard carsill housing which is secured to the underside of a railroad car and wherein said housing has predetermined height and width dimensional limitations, said assembly comprising:

a yoke received in said carsill housing in spaced relation from the underside thereof and including a front end having an opening extending therethrough with a pair of opposed, transversely spaced apart first and second straps extending rearwardly therefrom parallel to the yoke's longitudinal axis, a section of the inner wall of each of said first and second straps adjacent said front end having an arcuate concave conformation transverse to said yoke axis for defining a generally cylindrical rotary connector receiving chamber, and a dished out portion on the inner wall of each of said straps spaced rearwardly from said front end in communication with said section of the associated strap and,

a generally cylindrical rotary connector adapted to be positioned within said receiving chamber and freely rotated about said yoke longitudinal axis, said connector having an outside diameter greater than the transverse distance between said straps except at said sections and dished out portions, said connector including a body portion having an axial length less than the minimum transverse distance



between said straps and having a pair of oppositely beveled outwardly facing edge portions provided on opposing side wall portions thereof, said beveled edge portions cooperating with the dished out portions of said straps during the process of positioning said connector in said yoke for allowing said connector to be rotated about an axis normal to the connector longitudinal axis and permitting said conector to be generally coaxially located in said receiving chamber, whereby said yoke may accomodate a larger rotary connector which is adapted to permit the coupler assembly to accommodate a larger, sturdier coupler shank.

4,593,829

ARTICULATED RAILWAY CAR CONNECTION WITH GUIDED SLACK ADJUSTING WEDGES

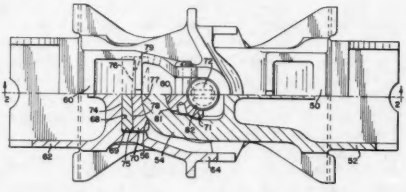
Russell G. Altherr, Munster, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 15, 1983, Ser. No. 561,874

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.[4] B61G *1/28, 5/02*

U.S. Cl. 213—75 R **2 Claims**



1. A coupler arrangement for adjacent ends of railway cars comprising,

a female member having top, bottom and side walls forming an open cavity therein, said top and bottom walls having vertically aligned holes therein,

a male member having an arcuate end surface with a vertical hole near said end,

said male member fitting within said cavity, a pin means extending through the vertically aligned holes in the female and the male member thereby pivotally connecting said female and said male members,

a pin bearing block located between said pin means and the hole in the male member,

a follower block having a front arcuate surface abutting the arcuate end surface of said male member and a rear surface conprising two generally planar surfaces joined along a centrally located vertical axis, said planar surfaces extending from said vertical axis at angles of 0°–20° from the horizontal to form a convex arrangement,

and a shim member having a sloped rear surface abutting a sloped interior wall of the female member cavity and a front surface abutting the rear surface of the follower block, the shim member front surface comprising two generally planar surfaces joined along a centrally located vertical axis, said planar surfaces extending from said vertical axis at angles of 0°–20° from the horizontal to form a concave arrangement complementary to the convex arrangement of the rear surface of the follower block.

4,593,830

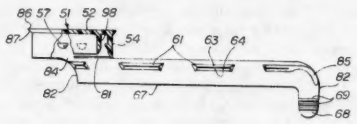
TAMPER-RESISTANT CONTAINER CLOSURE HAVING AUXILIARY REMOVAL FEATURES

Joseph J. Bullock, Atherton, Calif., assignor to Bankers Trust Company, New York, N.Y.

Continuation-in-part of Ser. No. 652,525, Sep. 20, 1984, which is a continuation-in-part of Ser. No. 517,666, Jul. 27, 1983, Pat. No. 4,484,687. This application Jan. 31, 1985, Ser. No. 697,007

Int. Cl.[4] B65D *41/48*

U.S. Cl. 215—256 **10 Claims**



1. A plastic cap for sealing a container neck having a top finish comprising a top disc having a depending skirt, said skirt having first bead means extending around the inside of said skirt spaced downward from said disc, second bead means extending around the inside of said skirt spaced downward from said first bead means, a first scoreline between said first and second bead means, said first score-line extending only partially around said skirt with an unscored area of between 10 and 180 degrees arcuate length at the end of said first score-line, a second scoreline extending up from the bottom edge of said skirt and merging with said first score-line, tear means on said bottom edge adjacent said second score-line, whereby by pulling said tear means the bottom of said skirt may be torn by tearing upward along said second score-line and then around said first score-line to the end of said first scoreline and thereby to release said second bead means from said top finish, the portion of said skirt below said first scoreline remaining attached to the upper portion of said skirt at said unscored area, said first and second bead means being engageable with third and fourth bead means, respectively, on the exterior of said neck to resist removal of said cap without tearing said skirt up to said unscored area, the portion of said skirt below said first scoreline comprising gripping means for pulling said cap off said neck by stretching said skirt to release said first bead means from said third bead means.

4,593,831

CONTAINERS

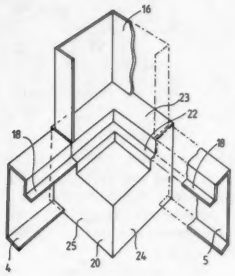
Martin Clive-Smith, 151 Broomwood Road, London SW11 6JV, England

Continuation of Ser. No. 441,104, Nov. 12, 1982. This application Nov. 28, 1984, Ser. No. 675,465

Claims priority, application United Kingdom, Nov. 13, 1981, 8134212; May 20, 1982, 8214709

Int. Cl.[4] F16B *5/00*

U.S. Cl. 220—1.5 **12 Claims**



1. A cuboid container, said container comprising:

frame members of elongate configuration with elongate surfaces defined thereon, the frame members being located to form a frame which defines edges of the container:

a plurality of cuboid corner members located at the junctions of the frame members and interconnecting the frame members, (i) each corner member having three outwardly facing faces, and three inwardly facing faces, (ii) at least some of the corner members having respective portions of at least one of the three inwardly facing faces absent in the region of the innermost corner of said corner members to define a recess therein, said recess bounded by edges of the three inwardly facing faces of said corner members, (iii) an inner surface on each of two perpendicularly oriented frame members interconnected by said corner members with said recess, said inner surface being aligned with a corresponding surface on the corner member, said corresponding surface defined by said recess, the aligned surfaces continuing to form a corner, and (iv) substantially all of each end of each frame member being within the periphery of, abutting and being secured to a respective face of a corner member such that no portion of the corner member extends past said end of each frame member, and means defining faces of the container.

4,593,832

FREIGHT CONTAINER

Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwalder Eisenwerk Gerhard GmbH, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,037

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1982, 3212696

Int. Cl.[4] B65D *88/06, 88/12*

U.S. Cl. 220—1.5 **22 Claims**

1. A freight container comprising:

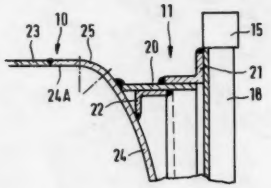
(a) a cylindrical tank shell which defines a longitudinal axis and tank end portions each joined to the tank shell with a knuckle zone of a radius of curvature which is smaller than the radius of curvature of each tank end portion,

(b) two end frames defining the overall dimensions of the container, each end frame having upper and lower transverse beams, vertical supports and corner fittings, and

(c) means joining the tank to each end frame and including

(c1) end rings each welded to a part of the respective tank end portions surrounded by and in close proximity to said knuckle zone, and

(c2) saddle structures each having a first flange joined to a portion of said end ring and a second flange extending



substantially perpendicularly to said first flange and being joined to said respective end frame, said saddle structures being spaced from the cylindrical shell and the respective tank end portions and engaging the respective end rings at a location disposed inside of the maximum diameter of the cylindrical shell.

4,593,833

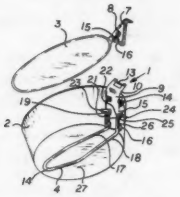
VESSEL HANDLE ATTACHMENT

Charles A. Hill, 4641 Mt. Forde Ave., San Diego, Calif. 92117

Filed Sep. 26, 1985, Ser. No. 780,208

Int. Cl.[4] B65D *43/26*

U.S. Cl. 220—94 R **3 Claims**



1. An improved handle attachment of the type used to connect a detachable handle and a lid to a vessel formed from a metal stamping, said lid comprising a hinge-lever integral with said lid having two parallel slotted tabs, wherein the improvement comprises:

a member of a generally rectangular shape, welded depthwise to the outer surface of said vessel;

a tongue of a generally rectangular shape, integral with the top of the member, and extending upwardly and angularly therefrom;

said tongue being rectangularly perforated to leave a thin band of metal along its upper edge;

a first and second pairs of tabs, of a generally rectangular shape, integral with the member and protruding outwardly and orthogonally therefrom;

said second pair of tabs being located at about half the depth of the vessel, and dorsally at each side of the member, each tab of said second pair having a hole in the middle thereof;

said first pair of tabs being located near the tongue and dorsally at each side of the member, each tab of said first pair having its outer edge bent inwardly; and

a detachable handle comprising:

a U-shaped loop;

a pair of identical and coplanar L-shaped legs extending from the end of said loop and nearly orthogonally to the plane thereof; and

said legs being shaped and dimensioned so that their ends engage the holes of said second pair of tabs, and fit beneath the bent outer edges of said first pair of tabs.

4,593,834

OPENING MEANS FOR OBLONG CANS

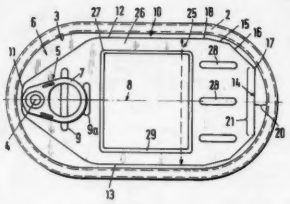
Peter Höft, Braunschweig; Wolfgang Peter; Heinz Hacke, both of Cuxhaven; Jürgen Lühr, Ihlienworth; Johann Bergsteiner; Wolfgang Drobe, both of Bremerhaven; Fritz Engelke, Cuxhaven; Walter Hebbinghaus, Cuxhaven, and Siegfried Kuhnert, Cuxhaven, all of Fed. Rep. of Germany, assignors to Schmalbach-Lubeca AG, Braunschweig, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 762,159

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430382

Int. Cl.[4] B65D *17/34*

U.S. Cl. 220—273 **6 Claims**



1. A tin lid for out-of-round cans, in particular, cans rounded oblong, for instance, in Hansa format, comprising a tear-open portion which takes up almost the greatest part of the lid image section defined by the lid core wall, is enclosed by a self-contained notch line including a starting portion in the area of one lid end and extending tightly along the longitudinal lid edges and parallel thereto, and which has secured thereto, in the area near to the starting portion, a lever-type pull-open ring so as to be in flat contact with said tear-open portion, the end of the pull-open ring extending in the longitudinal lid direction, wherein the tear-open portion is stiffened by means of a plurality of beads or the like, which are aligned with the longitudinal lid direction and/or with the transverse lid direction in a predetermined manner, characterized in that said tear-open portion (**26**) is defined by a notch line section (**14**) provided at the end of the lid (**1**) remote from the starting portion (**11**), the length (**21**) of said notch line section being considerably smaller than the maximum width (**25**) of the tear-open portion, approximately parallel thereto and with said notch line section being straight-lined and extending in chordal-type fashion with respect to an arc-shaped extension of the core wall (**3**), the distance (**20**) between the straight-lined notch line section (**14**) and the lid core wall (**3**)—measured along the longitudinal center line (**8**) of the lid—ranging between 2 and 15 mm.

4,593,835

CRYOGENIC LIQUEFIED PUMP SYSTEM

Seiichi Kikkawa, Katsuta; Hisanao Ogata; Yoshinori Hakuraku, both of Chiyoda; Masahiro Mase, Tochigi; Nobuo Tsumaki, Ushiku; Yoshihisa Awada, and Hiroki Kajiwara, both of Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,002

Claims priority, application Japan, Apr. 27, 1983, 58-72906

Int. Cl.[4] B67D *5/60, 5/64*

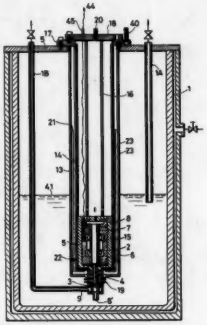
U.S. Cl. 222—131 **10 Claims**

1. A cryogenic liquefied pump system adapted to be disposed in a vessel storing a cryogenic liquid, the system comprising:

an outer insulating tank adapted to be mounted in the vessel,

an inner insulating tank disposed inside the outer insulating tank, said inner and outer insulating tanks being dimen-

sioned such that a space is provided between an outer peripheral surface of the inner insulating tank and an inner peripheral surface of the outer insulating tank, means for enabling an evacuation of the space between the inner and outer insulating tanks so as to form a room temperature region in an interior of the inner insulating tank, a pump means for discharging the cryogenic liquid from the vessel, the pump means including drive motor means having a driving shaft means, an impeller means mounted on said



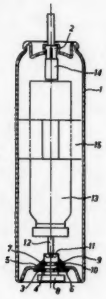
driving shaft means, and bearing means for rotatably supporting said drive shaft means, said inner insulating tank means including an outer case portion disposed in a cryogenic region of the vessel outside of the outer insulating tank, means are provided for mounting said pump means such that said drive motor and said bearing means are disposed in the room temperature region of the inner insulating tank, and wherein said impeller means is disposed in the outer case portion.

4,593,836

DOUBLE CHAMBER AEROSOL CONTAINER

Johannes H. Lilienthal, Wulfsdal, Fed. Rep. of Germany, assignor to Societe Avitex, Saint Maur, France

Filed May 10, 1984, Ser. No. 608,727
Claims priority, application France, May 13, 1983, 83 07989
Int. Cl.[4] B65D *83/14*
U.S. Cl. 222—136 **4 Claims**



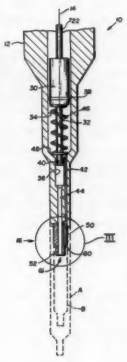
1. A double-chamber aerosol container for the packaging of products with several components which are to come into contact and be mixed at the time of use; the said container comprising an outer aerosol receptacle having a dispensing valve at its upper end, said outer receptacle being adapted to contain one of the components of the product, an orifice in the bottom of the outer receptacle, an annular sealing gasket fitted in said orifice, said sealing gasket having an inwardly projecting annular collar, a closing plug fitted in said annular gasket, a pair of spaced apart annular groves in said closing plug, said closing plug being initially fitted in said annular gasket with said annular collar seated in one groove of said pair of annular grooves, an inner aerosol receptacle contained within said outer receptacle, said inner receptacle being smaller than said outer receptacle and having a stem valve at one end, said inner receptacle being adapted to contain a propellent gas and another component of the product, said inner receptacle being positioned upside down with respect to said outer container with its stem valve seated on the inner end of said closing plug, a strut in said outer receptacle positioned to prevent axial displacement of said inner receptacle, said closing plug being displaceable inwardly to a position wherein said annular collar seats in the other groove of said pair of annular grooves, whereby the stem valve of the inner receptacle is opened and the contents of the inner receptacle discharged into the outer container and admixed with its contents, and the sealed condition of the outer receptacle and positioning of the closing plug is ensured by the engagement of said annular collar with the other groove of said pair of annular grooves.

4,593,837

VARIABLE VOLUME PIPETTE

Raymond F. Jakubowicz, Rush, and Stuart G. MacDonald, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1985, Ser. No. 711,949
Int. Cl.[4] G01F *11/28*
U.S. Cl. 222—288 **6 Claims**



1. In a pipette for dispensing variable volumes and comprising a plurality of piston chambers, a piston constructed to reciprocate within each of said chambers, means for reciprocating said pistons, a passageway extending from each chamber to a next adjacent chamber, a vent passageway extending from each of said chambers to the exterior of the pipette, and mounting means for mounting disposable tips on the pipette;

the improvement wherein said mounting means comprises differently-sized mounting surfaces for mounting differently-sized disposable tips,

and wherein all but one of said vent passageways exits on the exterior surface of said pipette at a location disposed between the mounting surface corresponding to the piston chamber vented by said each vent passageway, and the next smaller mounting surface,

whereby the larger disposable tips enclose the vent passageways of the smaller disposable tips.

4,593,838

APPARATUS FOR REPLACEABLY CONNECTING A CASTING TUBE TO A CLOSABLE POURING SPOUT OF A TUNDISH

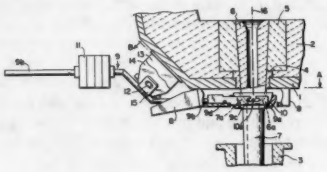
Manfred Oberbach, and Laurenz Keisers, both of Krefeld, Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 16, 1984, Ser. No. 641,290

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332186

Int. Cl.[4] **B22D** *35/00;* **B67D** *3/00;* **B65B** *1/04;* **G05G** *1/04*

U.S. Cl. 222—607 **13 Claims**



1. An apparatus for replaceably connecting a casting tube to a closable pouring spout of a tundish of a continuous casting plant, particularly for the continuous casting of bars of small cross section, wherein the casting tube extends into a permanent ingot mold to maintain molten metal being discharged from the pouring spout out of contact with the surrounding air, said apparatus comprising:

a gimbal device for supporting the casting tube;

a double-arm lever including a first arm supporting said gimbal device and a second arm carrying a counterweight;

pivot means for supporting said lever such that said counterweight pivots said lever about an axis and causes said first arm and said gimbal device to press the casting tube against the mouth of the pouring spout, said pivot means comprising support means adapted to be fixed to the tundish, said support means having therein first slots elongated in directions transverse to said axis and said lever having associated therewith a second slot elongated in a direction transverse to said axis and generally orthogonal to said directions of elongation of said first slots in said support means, a pin member defining said axis, and mounting means for moving said pin member between an operative position extending through said first and second slots and pivotally supporting said lever on said support means and an inoperative position whereat said lever is released from said support means; and

lock means for holding said pin member in said operative position.

4,593,839

GARMENT STRETCHER

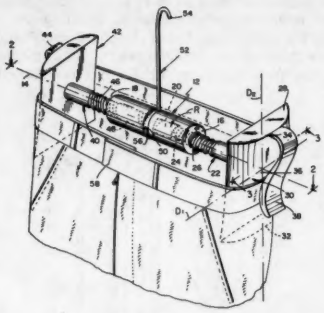
Steven J. Vandoros, 164-39 95th St., Howard Beach, N.Y. 11414

Filed Mar. 1, 1985, Ser. No. 707,470

Int. Cl.[4] **D06C** *5/00;* **A47J** *51/08*

U.S. Cl. 223—63 **10 Claims**

1. A garment stretcher adapted for distending a localized region of a garment such as a waistband dimension comprising a barrel member having two ends and defining a longitudinal axis, said barrel member being removably insertable within the garment, a first rod member including a proximal end threadably engageable with one end of said barrel member, and a second rod member including a second proximal end threadably engageable with the other end of said barrel member, pad means for engaging the garment, said pad means being mounted at a distal end of each of said rod members, said pad means further having a width dimension transverse to the longitudinal axis, said width dimension being greater than the transverse width dimension of the barrel member for spacing the garment transversely from the barrel member so as to provide access for hand engagement of the barrel member, said pad means being rotatable about the longitudinal axis for engaged alignment with the localized region of the garment,



rotational means for generating a distention force along the longitudinal axis of the barrel member, whereby said pad means are extendably displaceable from the respective ends of the barrel member to stretch the garment.

4,593,840

LOAD CARRYING UNIT

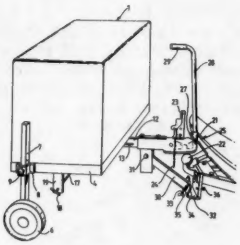
Peter A. C. Chown, Foldgate Lane, Wiggenhall St Mary Magdalen, Kings Lynn, Norfolk, England

Filed May 21, 1984, Ser. No. 612,379

Claims priority, application United Kingdom, May 24, 1983, 8314344; Jul. 2, 1983, 8318032; Sep. 22, 1983, 8325388; Dec. 20, 1983, 8333920

Int. Cl.[4] **B60R** *9/00*

U.S. Cl. 224—42.03 A **8 Claims**



1. A load carrying unit for attachment to a vehicle having a ball member of a ball joint mounted thereon, the unit comprising:

a load carrying portion;

wheel means;

wheel mounting means retractably mounting said wheel means with respect to said load carrying portion;

fixing means comprising fastening means including a socket cooperable with the ball member to releasably fasten said load carrying portion to the vehicle;

means coupling said fixing means to said load carrying portion;

support arm means;

means coupling said support arm means to said load carrying portion; and

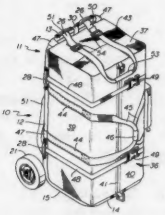
means releasably coupling said support arm means to the vehicle, whereby to hold the load carrying portion clear of the ground, when said wheel mounting means have retracted said wheel means.

4,593,841

PACK CART

Roland Lange, Port Arthur, Tex., assignor to Underwater Design Technology Inc., Nederland, Tex.

Filed Feb. 15, 1985, Ser. No. 701,551
Int. Cl.[4] A45F *4/02*
U.S. Cl. 224—153 **15 Claims**



1. A pack cart carrying means convertible for use as a cart for wheeling a load over the ground, for use as a back pack for carrying loads on the back, or for carrying loads by hand comprising:

a tubular frame comprising a closed loop generally L-shaped configuration having two parallel L-shaped tubular side rails with connecting transverse tubular top rail and tubular bottom rail portions extending perpendicularly between said side rails and adapted to have a pack secured within said L-shaped configuration,

a pair of strap brackets secured in a spaced relation on said top rail,

a single strap bracket centrally secured on said bottom rail, and

a pair of vertically spaced strap brackets secured to each side rail in a horizontally aligned position,

said strap brackets having a central portion which is raised from the tubular surface sufficient to receive a strap therethrough,

a centrally disposed frame strap extending downwardly from said top rail, over said axle housing, outwardly therefrom, and through the said strap bracket on said bottom rail,

each end of the strap being looped over said top and bottom rail and adjustably secured on itself by adjustment slides,

a hollow tubular axle housing member secured to said frame transversely between said side rails,

an axle member removably and rotatably received within said axle housing,

a pair of wheels rotatably and removably carried on opposite ends of said axle member, and

quick release retaining means carried on said axle member for selectively removing and installing said wheels thereon,

two shoulder straps each looped around the intersection of said side rails with said axle housing with adjustment slides and extending upwardly therefrom through said strap brackets on said top rail,

the extended ends of the shoulder straps being joined to form a loop above said top rail with a small section of tubing supported thereon to form a handle for pulling the pack cart when pulled to an extended position,

one of said shoulder straps provided with a quick release buckle for allowing the pack cart assembly to be easily installed and removed from the shouldr mounted carrying position,

said shoulder straps being of sufficient length when pulled out to a point where said handle is adjacent to said top rail brackets to support said cart on the shoulders and back of the user, and when the handle is pulled to a fully extended position to provide a length of said straps sufficient for pulling said cart along the ground, with the wheels installed,

a hollow tubular axle housing member secured to said frame transversely between said side rails,

an axle member removably and rotatably received within said axle housing,

wheels rotatably and removably carried on said axle member, and

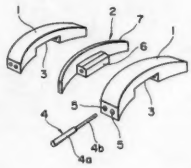
quick release retaining means carried on said axle member for selectively removing and installing said wheels thereon.

4,593,842

WATCH BAND

Sukeo Koenuma, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 671,950
Int. Cl.[4] A44C *5/12*
U.S. Cl. 224—179 **10 Claims**



1. A watch band having a plurality of links, and a plurality of connecting links for connecting the links with each other, characterized in that each link has a recess at the underside thereof, each connecting link comprising a plate member and a connecting block which is engaged with recesses of adjacent links, each plate member being secured to each connecting block at a central portion with respect to the width of the band so as to form connecting portions on both sides of the plate member, each link having a pair of holes at both lateral sides thereof, each connecting portion of the connecting block having a hole at both lateral sides thereof, each hole of the connecting portion being so disposed as to correspond to a hole of an adjacent link, said adjacent links being connected by engaging pins with the corresponding holes of the links and the connecting block, and the plate member is so arranged that the surface thereof is exposed between adjacent links at whole width of the band.

4,593,843

SURGICAL STAPLER FOR IMPLANTING SUTURES

Lawrence M. Saravis, 23 Yale Ave., Milford, Conn. 06460

Filed Aug. 24, 1982, Ser. No. 410,936
Int. Cl.[4] A61B *17/04*
U.S. Cl. 227—19 **10 Claims**

1. A surgical stapler for implanting sutures which comprises:

(a) a hollow elongated oblong body, together with means at one end of said body to grasp said body with and between two fingers of a human hand,

(b) a generally rectilinear moveable plunger, said plunger extending within and generally parallel to the longitudinal axis of said body,

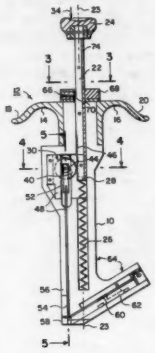
(c) a knob means, said knob means being mounted to the outer end of said plunger, so that said plunger may be manually depressed into said body by a human finger, by pressing on said knob means while manually restraining the grasping means of (a),

(d) a spring, said spring being mounted within said body and opposed to the inwards movement of said plunger into said body,

(e) a rotatable unitary cluster gearing element, said gearing element being mounted within said body, the axis of said gearing element being substantially transverse to the longitudinal axis of said body; said gearing element compris-

ing a first circular gear and a second circular gear, said gears being joined to each other and coaxially aligned and juxtaposed along the axis of said gearing element, said first gear being of larger diameter than said second gear, with the teeth of said first gear meshing with teeth spaced in a generally rectilinear array along a first toothed rack, said first rack comprising a portion of said plunger,

(f) a generally rectilinear staple pusher element, said pusher element being disposed within said body and depending from a second toothed rack, the teeth of said second rack being spaced in a generally rectilinear array along said



second rack and meshing with said second gear, said pusher element terminating with a bifurcated outer end terminus at the head of the stapler body,

(g) an anvil, said anvil being mounted to said body and being juxtaposed with said bifurcated terminus of said pusher element, so that staples fed seriatim to said anvil are manipulated into a closed loop configuration by said bifurcated terminus, and

(h) a magazine means, said magazine means being mounted integrally with said body adjacent said anvil and containing a plurality of staples, so that staples are fed seriatim to said anvil.

4,593,844

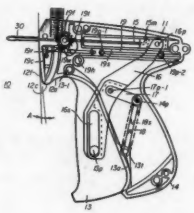
DISPENSING OF FASTENERS

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 317,218, Nov. 2, 1981, Pat. No. 4,416,407. This application Aug. 29, 1983, Ser. No. 526,947

Int. Cl.[4] A41H *37/00;* **B25C** *1/00*

U.S. Cl. 227—67 **2 Claims**



1. Apparatus for dispensing fasteners comprising

a device for receiving and feeding an assemblage of fasteners;

the device including a slotted hollow needle at the frontal portion thereof through which said fasteners are expelled individually;

said device having a frontal portion below said needle which lies within an angle no greater than 15° at a plane tangent to said frontal portion at the position of said needle; and an actuator pivotally mounted on said device for feeding fasteners through said slotted needle and having a finger gripping portion thereon, said actuator being positioned to permit the user to grip said actuator and simultaneously position an index finger against said frontal portion.

4,593,845

OSCILLATING SEPARATOR FOR A FASTENER-DRIVING DEVICE

Jonny Andersson, Stensborg, S-740 41 Morgongåva, and Stellan Lund, Spadvägen 2, S-740 40 Heby, both of Sweden

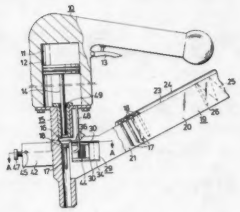
PCT No. PCT/SE83/00170, § 371 Date Dec. 28, 1983, § 102(e) Date Dec. 28, 1983, PCT Pub. No. WO83/03790, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 28, 1983, Ser. No. 571,545

Claims priority, application Sweden, Apr. 28, 1982, 8202672

Int. Cl.[4] B25C *5/00, 1/04*

U.S. Cl. 227—117 **5 Claims**

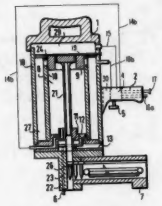


1. A fastener-driving device for feeding and driving fasteners such as nails, screws and the like, said device comprising: fastener driving means; a fastener receiving and guiding means connected to said fastener driving means for receiving and guiding fasteners into a driving position relative to said fastener-driving means; a fastener magazine connected to said fastener receiving and guiding means and having a guide channel for guiding a plurality of fasteners arranged in side-by-side relationship for movement in a plane along said guide channel toward said fastener receiving and guiding means; and feed means connected to said fastener receiving and guiding means for feeding fasteners arriving from said magazine one at a time to said receiving and guiding means, said feed means including a bifurcate member which is positioned to assist said guide channel in guiding the fasteners during passage of said fasteners between the magazine and the fastener receiving and guiding means, said bifurcate member mounted on a rotatable shaft that defines a rotary axis located adjacent the guide channel, said bifurcate member including a recess defined by a pair of spaced tines, the width of which recess is adapted to receive one fastener at a time, said bifurcate member reciprocatingly pivotable from a fastener-receiving position, in which the recess is directed obliquely toward the magazine and a mouth of said recess formed by outer end edges of the tines of the bifurcate member extends across at least substantially the whole width of the guide channel, to and beyond a fastener-delivering position in which the recess is directed obliquely toward said fastener receiving and guiding means and the mouth of said recess extends across at least substantially the whole width of the guide channel, through an intermediate position in which said recess extends transversely across the whole of the guide channel, wherein said recess has the form of an elongate groove extending in the direction of said rotary axis, and wherein a mouth-defining edge of said groove which is located nearest the magazine forms an acute angle relative to said plane.

4,593,846
HAMMER-TOOL, PARTICULARLY FOR DRIVING BOLTS AND LIKE FASTENERS

Egon Evertz, Vorländer Str. 23, and Rolf Seybold, Eichenstrase 21a, both of 5650 Solingen, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 559,105
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245118
Int. Cl.[4] B25C *1/04*
U.S. Cl. 227—130 9 Claims



1. A tool, for driving bolts and like fasteners, comprising:

a piston having a height; a valve; a cylinder adapted to be charged with compressed air by actuation of said valve, said piston picking up impact energy along an acceleration path; said cylinder having an inlet orifice disposed on a side of said cylinder;

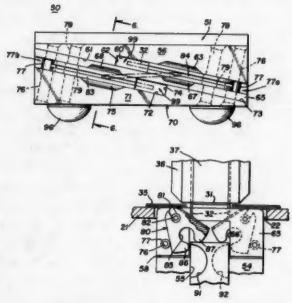
said piston being disposed for travel inside said cylinder; said cylinder being disposed within a surrounding housing and is connected to a compressed air supply; said port being disposed on a side of said cylinder which is opposite said side on which said inlet orifice is disposed;

an upper wall of said cylinder on a side of said cylinder; which corresponds to a retracted piston position, is perforated by windows; each one of said windows having an axial extension which is less than that of said piston height, wherein in said retracted piston position said piston overlaps said windows and is displaceable from this position for triggering a strike action by movement to an axial position thereby exposing progressively an initial upper section of said windows, said piston being further subjected to a restoring force by a means for restoring.

4,593,847
BYPASS CLINCHER FOR STITCHING MACHINE

Casper W. Hagemann, Racine, Wis., assignor to Interlake, Inc., Oak Brook, Ill.

Filed May 1, 1985, Ser. No. 729,422
Int. Cl.[4] B25C *7/00*
U.S. Cl. 227—155 17 Claims

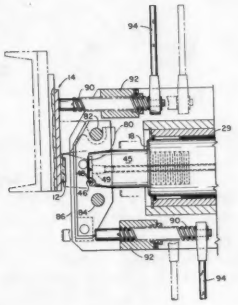


1. In a stitching machine for driving through associated work a U-shaped staple having a pair of dependent legs interconnected by a bight portion disposed parallel to a first plane, and including clinching means having a deflection channel therein disposed parallel to a second plane which is non-parallel to the first plane, wherein the clinching means is movable between a retracted position for receiving the staple legs as they exit the work and deflecting them along the channel, and a clinching position for folding the legs against the work to a clinched condition wherein the legs are disposed in overlapping parallel relationship with each other but are non-parallel with the bight portion, the improvement comprising: means mounting said clinching means for movement parallel to the second plane between the retracted and clinching positions thereof.

4,593,848
BUTTON CONTACT JOINING MACHINE

David E. Hochbein, Sarver, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 28, 1985, Ser. No. 695,524
Int. Cl.[4] B23K *20/12, 20/24*
U.S. Cl. 228—2 3 Claims



1. Portable apparatus for inertia welding metal pieces to an electrical conductor while the conductor is carrying electrical current, the conductor having hook structures for supporting the apparatus on the conductor, the apparatus comprising:

a spindle adapted to receive and hold a metal piece in a forward end thereof for rotation against the conductor,

means, including an air-operated motor and a bearing-mounted mechanical screw, for translating said spindle toward and away from the conductor,

a flywheel and a second air-operated motor for rotating the spindle and metal piece,

bar means for seating in the hook structures,

translatable threaded shaft means for holding the bar means firmly against the hook structures when the bar means is seated in the hook structures and the shaft means is moved against the conductor, and

electrically insulating hoses connecting said motors to a source of pressurized air.

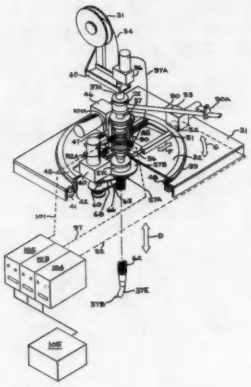
4,593,849
ROTARY WELDING DEVICE

John N. Doering, Louisville, Ky., assignor to Republic Welding Company, Louisville, Ky.

Filed Sep. 24, 1984, Ser. No. 653,289
Int. Cl.[4] B23K *37/02*
U.S. Cl. 228—29 1 Claim

1. A welding device for building up metal by laying down a metal weld bead on a base metal in a selected pattern including: a base member to receive a rotatable table; drive means on the base to rotate the table at selected speeds; elongate tubular spindle means to rotate with the table, electrical buss, welding wire supply means and gas supply means to said spindle to

supply gas and wire to the area adjacent the point of exit of said wire form said spindle where said tip of said spindle serves as one electrode in a welding process and said base metal serves as the other so said spindle rotates with movement of said rotating table where said table further includes guide means to receive a slide member which carries said spindle whereby said slide member can be longitudinally moveable in said guide to



be selectively advanced and retracted; horizonal feed means also located on said rotating table to advance and retract said slide where said rotatable table further includes rotatable threaded connecting member to receive said spindle where the outside surface of said spindle is threaded so that upon rotation of said connecting member said spindle is raised and lowered relative to said rotating table.

4,593,850

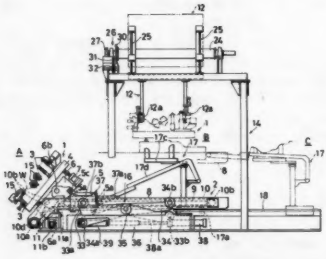
AUTOMATIC WELDING APPARATUS

Yoshio Ariga, Kawagoe, and Shinpei Watanabe, Hidakamachi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1985, Ser. No. 734,318

Int. Cl.[4] B23K *37/04, 28/02*

U.S. Cl. 228—47 **6 Claims**



1. An automatic welding apparatus comprising:

(a) a replaceable jig table;

(b) conveying means for carrying said jig table between a setting station and a welding station;

(c) temporary welding means mounted on said jig table for applying temporary welds to a workpiece while said jig table is being moved by said conveying means;

(d) at least one holding means at said welding station for removing said temporarily welded workpiece from said jig table and holding said workpiece therein; and

(e) additional welding means positioned with respect to said holding means for permanently welding said workpiece while said workpiece is held by said holding means and said jig table is being returned to the setting station by said conveying means.

4,593,851

METHOD OF CONNECTING ELEMENTS BY BRAZING

Erik Skog, Vellinge, Sweden, assignor to United Stirling AB, Sweden

Filed Jul. 17, 1984, Ser. No. 631,788

Int. Cl.[4] B23K *35/12*

U.S. Cl. 228—248 **4 Claims**

1. A method of connecting elements by brazing, comprising the steps of:

(a) preparing the surfaces of said elements to be connected by cleaning or metallizing said surfaces;

(b) arranging said elements in fixed, selected, relative positions;

(c) applying a fluid brazing material to said surfaces, said brazing material comprising a mixture of a metal powder and an anti-settling agent, said anti-settling agent becoming a fluid when mixed with said metal powder and agitated; and

(d) heating said elements to a predetermined temperature to braze said elements.

4,593,852

AIR CONDITIONER FOR AUTOMOBILE

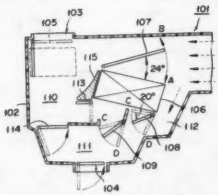
Katsuichirou Tajima, Sano, and Kosei Matsuda, Tatebayashi, both of Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,248

Claims priority, application Japan, Dec. 29, 1983, 58-201639[U]

Int. Cl.[4] B60H *1/02*

U.S. Cl. 237—12.3 A **12 Claims**



1. In an air conditioner for an automobile comprising a heater unit characterized by having an opening of a defrost duct formed in an upper portion thereof for guiding air toward the inner face of a windshield, an opening of a foot duct formed in the lower portion of said heater unit for guiding air toward an automobile occupant's foot rest, a heater core incorporated in a central portion of said heater unit, a first mixing chamber formed in the proximity of said opening of said defrost duct and a second mixing chamber formed in the proximity of said opening of said foot duct both within said heater unit, a first mix door for adjusting the amount of air flowing into said heater core and the amount of air bypassing said heater core and directly flowing into said first mixing chamber, said first mix door being attached rotatably to the front side of an air inlet face of said heater core, a second mix door for adjusting the amount of air flowing through said core heater into said second mixing chamber and the amount of air bypassing said heater core and flowing directly into said second mixing chamber and a third mix door for apportioning the air discharge side of said heater core, said first, second, and third mix doors being severally connected to temperature-adjusting levers within the

automobile interior, the improvement in which the opening degree of said first mix door in response to the stroke of the corresponding temperature-adjusting lever is always greater than that of said second mix door except when the first mix door is completely open or completely closed.

4,593,853

PLASTIC PIPE HAVING AN OXYGEN-IMPERMEABLE CASING

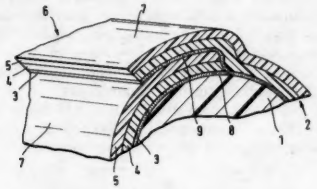
Alfred Schad, Wiesbaden, and Klaus Heyse, Bad Soden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 329,671, Dec. 11, 1981, abandoned. This application Oct. 11, 1983, Ser. No. 540,114

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1980, 3047181

Int. Cl.⁴ F16L *9/12*

U.S. Cl. 237—56 **14 Claims**



1. An oxygen-impermeable plastic pipe, comprising:

a self-supporting plastic pipe; and

a pre-formed film laminate casing wrapped about said pipe comprising,

(a) a heat sealable layer adjacent to the circumferential surface of said pipe and attached to said circumferential surface by a heat sealed bond, and

(b) a substantially oxygen-impermeable, biaxially stretch-oriented, elastic barrier layer adjacent to said sealable layer comprising polyvinyl alcohol or a vinyl alcohol/ethylene copolymer.

4,593,854

SNOW-MAKING MACHINE

Stig L. Albertsson, P.O. Box 297, Manchester, Vt. 05254

Filed Apr. 25, 1984, Ser. No. 603,598

Int. Cl.⁴ F25C *3/04*; B05B *7/04*

U.S. Cl. 239—14 **7 Claims**

1. A snow-making apparatus which comprises

(a) an air-water manifold ring comprising front and rear annular manifold chambers for water and air, respectively,

(b) a plurality of nozzle assemblies mounted on said manifold ring and having portions extending through the front manifold chamber and portions extending into said rear manifold chamber,

(c) an air-water mixing element in each of said nozzle assemblies in the portions thereof within said front chamber,

(d) said nozzles discharging air-water snow-making mixtures in a generally forwardly direction from the front face of said manifold ring,

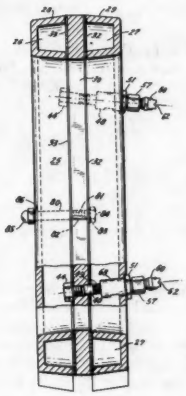
(e) said manifold ring comprising front and back chamber-forming housings and a separating ring interposed between said chamber-forming housings,

(f) said nozzle assemblies including portions extending through said front chamber-forming housing and through said separating ring,

(g) said nozzle assemblies each comprising an air tube member and a mixing sleeve connected thereto,

(h) said air tube member extending through said separating ring and communicating with said rear annular manifold chamber chamber,

(i) said mixing sleeve extending through said front housing and communication with said front annular manifold chamber with said air tube,



(j) said mixing sleeve having an inlet opening therein communicating with the interior of said front annular manifold chamber.

4,593,855

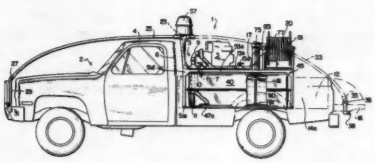
VEHICLE-MOUNTABLE FIRE FIGHTING APPARATUS

Robert W. Forsyth, Upland, Calif., assignor to Vehicle Systems Development Corporation, Upland, Calif.

Filed Jan. 24, 1984, Ser. No. 573,334

Int. Cl.⁴ A62C *27/18*

U.S. Cl. 239—74 **10 Claims**



1. A liquid-distributing module which is detachably mountable onto an operator-driven vehicle having a cab and a cargo hold, comprising:

(a) a storage tank for storing a supply of liquid;

(b) a pump for creating a flow of said liquid;

(c) an engine which is separate from a vehicle engine for powering the pump;

(d) a control means for regulating the distribution of said liquid from said tank, including an adjustable throttle for controlling the power output of the engine, and a valve for controlling the flow of liquid out of the tank, and

(e) a frame assembly which is detachably mountable onto a pre-existing portion of the cargo hold of the operator-driven vehicle for both unitizing and protecting said storage tank, pump, engine and control means, and for positioning said control means adjacent the vehicle cab, within reach of the vehicle operator, said frame assembly including a unitizing frame for unitizing the storage tank, pump, engine and control means in a compact configuration, and for positioning the control means substantially along one side of the resulting configuration, and a mounting frame connected to the unitizing frame for detachably

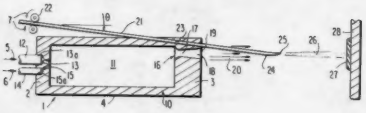
connecting the unitizing frame to the cargo hold of the operator-driven vehicle with the control means adjacent the cab of the vehicle.

4,593,856

METHOD AND APPARATUS FOR HIGH VELOCITY FLAME SPRAYING OF ASYMMETRICALLY FED WIRE RODS

James A. Browning, P.O. Box 6, Hanover, N.H. 03755

Filed Apr. 4, 1984, Ser. No. 596,791
Int. Cl.[4] B05B *1/24*
U.S. Cl. 239—83 **3 Claims**



1. In a flame spray method comprising the steps of:

continuously combusting, under pressure, a continuous flow of an oxy-fuel mixture confined within an essentially closed internal burner combustion chamber,

discharging the hot combustion product gases from the combustion chamber through a flow expansion nozzle as a high velocity hot gas stream flame jet, and

feeding material to the stream for high temperature heat softening or liquefaction,

spraying at high velocity onto a surface positioned in the path of the stream at the discharge end of the nozzle and spaced downstream therefrom,

the improvement wherein the step of feeding said material comprises feeding said material in solid rod form, outside of said combustion chamber asymmetrically and continuously into said flame jet at an angle to said flame jet and at a point downstream of the exit from the flow expansion nozzle with said introduction angle of the rod relative to the flame jet axis and the rod diameter being such that the rod bends within the flame jet to line up the rod tip with the flame jet axis;

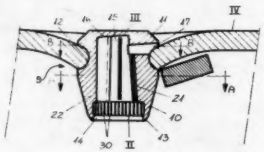
whereby, a liquid film develops about the periphery of the rod within the flame jet as a full symmetric circumferential coating about the unmelted portion of the rod within the flame jet, and the flame jet produces a very fine suspension of particles of the material forming the rod within the flame jet stream.

4,593,857

IRRIGATION EMITTER UNIT

Dan Raz, Haifa, Israel, assignor to Plassim Limited, Kibbutz Merhavia, Israel

Filed Nov. 6, 1984, Ser. No. 668,636
Claims priority, application Israel, Nov. 30, 1983, 70355
Int. Cl.[4] A01G *25/02*
U.S. Cl. 239—109 **14 Claims**



1. A drip irrigation emitter comprising

an axisymmetrical housing having a bottom portion, intended for insertion into a flexible irrigation pipe, in frusto-conical shape and provided at its small end with a central water inlet surrounded by a sharp circular cutting edge, a top portion provided with a water outlet intended for protrusion out of said irrigation pipe, and a cylindrical neck portion provided with a circumferential groove of an innermost diameter larger than said circular cutting edge and of a width larger than the thickness of the wall of said flexible pipe;

a flow control chamber positioned in said housing, said chamber having a bottom formed by a filter in said water inlet, a flat top, two planar side walls, a rear wall provided with protrusion means to prevent close adherence of a flow control member to said rear wall, and a front wall arched away from the rear wall around a radius of curvature extending axially of the housing and at a substantially uniform curvature, said front wall comprising a channel extending in the axial direction of the housing and communicating the central water inlet with said water outlet;

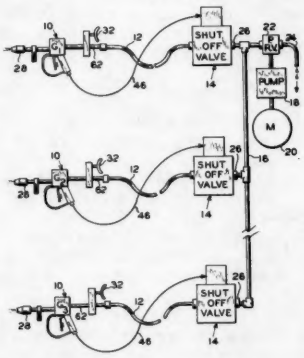
said flow control member being in the shape of a thin, resilient plate of a length commensurate with the height of said chamber and of a width slightly smaller than the distance between said planar side walls, said control member being freely movable in said chamber and adapted to be urged towards said front wall by low water pressure and to be gradually pressed into said channel and its banks by increasing water pressure, thereby decreasing the cross sectional area of said channel and said banks leading to said outlet, in a manner designed to provide a substantially constant outflow at different water pressures in said pipe.

4,593,858

FAIL-SAFE HIGH PRESSURE FLUID DELIVERY SYSTEM

Amos Pacht, Houston, Tex., assignor to Butterworth, Inc., Houston, Tex.

Filed Apr. 1, 1985, Ser. No. 719,003
Int. Cl.[4] B05B *9/03*
U.S. Cl. 239—126 **12 Claims**



1. In a fluid delivery system for supplying a high pressure stream of fluid to at least one hand-held fluid blasting gun, including a pump having a high pressure outlet manifold and a pressure regulating valve for dumping fluid discharged by said pump whenever the pressure in said outlet manifold exceeds a predetermined maximum, and a first fluid conduit between said outlet manifold and said gun, the improvement comprising at least one liquid blasting gun having a trigger operated first fluid shut-off valve therein, said valve including; a spring to bias said valve into a normally closed position, trigger means to mechanically bias said shut-off valve to an open position, and electrical switch means to complete an electrical conduit when said trigger means is operated to open said first valve, said electrical circuit including an electrically operated solenoid

valve connected to a pressurized air supply to actuate an associated high pressure fluid second shut-off valve, said second shut-off valve being located in said first fluid conduit between said gun and said pump outlet manifold and in series with said first shut-off valve, said second shut-off valve comprising; a body portion, a fluid inlet port, a fluid outlet port, a cylindrical bore in fluid communication with said inlet port, a valve piston reciprocal within said cylindrical bore, valve seat means in one end of said bore, said piston having a first end arranged for seating engagement with said valve seat means to stop fluid flow between said inlet port and said outlet port, a first passageway in said valve piston to place the fluid pressure in said inlet port in fluid communication with a second end of said piston to force said piston into contact with said valve seat means, a second passageway in said piston to place the fluid pressure in said outlet port in fluid communication with a pressure equilization chamber intermediate said piston first and second ends, and a pneumatic piston in said second shut-off valve body portion responsive to said pressurized air supply, said pneumatic piston including means to displace said valve piston from said valve seat means to place said fluid inlet port in fluid communication with said fluid outlet port upon operation of said trigger and completion of said electrical circuit, whereby substantially simultaneous opening and closing of each of said series connected first and second fluid shut-off valves will occur upon operation and release of said trigger.

4,593,859

PREPARATION OF DEASHED HIGH SOLID CONCENTRATION COAL-WATER SLURRY

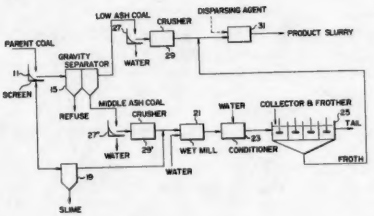
Kazuhiko Nakaoji, Ichihara; Mitsugu Kamao, Chigasaki; Kunizo Shinano, Matsudo; Takashi Kuwabara; Masazumi Ito, both of Kawasaki; Kaoru Aoki, Hiratsuka; Hayami Ito, Himeji; Shuhei Tatsumi; Shoichi Takao, both of Akashi; Nitaro Suzuki, and Takashi Watanabe, both of Funabashi, all of Japan, assignors to Electric Power Development Co., Ltd., Tokyo; Kawasaki Jukogyo Kabushiki Kaisha, Kobe and Sumitomo Heavy Industries, Ltd., Tokyo, all of, Japan

Filed May 17, 1984, Ser. No. 611,069

Claims priority, application Japan, May 21, 1983, 58-89699

Int. Cl.⁴ B02C *19/12*

U.S. Cl. 241—20 **4 Claims**



1. A process for preparing a deashed, coal-water slurry containing at least 60 wt. % of coal solids, at least 50 wt. % of said coal solids having a particle size of less than 200 mesh, which comprises the steps of:

(a) subjecting coal particles having a particle size of less than 100 mm to gravity classification and separation, and separately recovering three fractions as follows:

(i) particles of low ash coal having a specific gravity of 1.4 or less,

(ii) particles of high ash coal having a specific gravity of 1.5 or higher, and

(iii) particles of middle ash coal having a specific gravity of higher than that of said low ash coal and lower than that of said high ash coal;

(b) grinding said middle ash coal fraction (iii) so that 50 wt. % or more of said middle ash coal fraction has a particle size of less than 200 mesh and adding water thereto to obtain a middle ash coal-water slurry containing from 5 to 25 wt. % of middle ash coal particles;

(c) subjecting said middle ash coal-water slurry obtained in step (b) to flotation and separately obtaining

(iv) a froth of coal particles having a reduced ash content, and

(v) tailings having an increased ash content; and

(d) mixing the froth (iv) obtained in step (c) with the low ash coal fraction (i) obtained in step (a) to obtain a mixture containing at least 60 wt. % of coal particles, and subjecting the mixture to wet grinding so that 50 wt. % or more of the coal contained in the mixture has a particle size of less than 200 mesh, whereby to obtain said deashed, coal-water slurry.

4,593,860

METHOD FOR IMPROVING HANDLEABILITY OF CALCINED KAOLIN CLAY PRODUCTS

Jerry A. Cook, Cartersville; Robert H. Garner, Sandersville; Ralph E. Turner, Jr., and Bomi M. Bilimoria, both of Tennille, all of Ga., assignors to Anglo American Clays Corporation, Atlanta, Ga.

Continuation of Ser. No. 341,918, Jan. 21, 1982, abandoned. This application Nov. 2, 1984, Ser. No. 667,400

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.⁴ B02C *21/00*

U.S. Cl. 241—23 **8 Claims**

1. A method of preparing a calcined kaolin clay powder having increased bulk density and decreased wet-out time comprising:

(a) heating a kaolin clay powder of fine particle size to at least 400° C. to render same at least substantially anhydrous; and

(b) dry ball-milling said anhydrous clay powder using a work input in the range of from about 5 to about 40 HP-hrs/ton of dry clay.

4,593,861

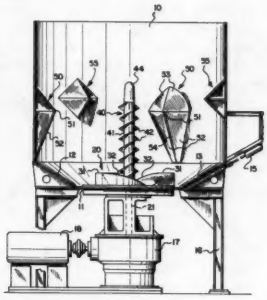
APPARATUS FOR PULPING PAPER MAKING STOCK AT HIGH CONSISTENCIES

Earl T. Blakley, Cincinnati, and Paul G. Marsh, Hamilton, both of Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 407,371, Aug. 12, 1982, abandoned. This application Dec. 7, 1984, Ser. No. 698,731

Int. Cl.⁴ B02C *13/18*

U.S. Cl. 241—46.02 **10 Claims**



1. Pulping apparatus for defibering paper making stock at high consistencies, comprising:

(a) a tub having an upwardly extending cylindrical wall and open at the top thereof to receive stock to be defibered,

(b) a rotor mounted for rotation on a vertical axis in the center of the bottom of said tub,

(c) drive means constructed to rotate said rotor only in a single predetermined direction,

(d) said rotor including vanes each having a single working surface facing in said direction of rotation for responding to rotation of said rotor by impelling high consistency pulp stock within said tub toward said tub wall with sufficient force to climb said wall,

(e) baffle means on said wall positioned to redirect said climbing stock back toward the center of said tub,

(f) feed screw means mounted on said rotor for rotation therewith in said direction and including flight means responsive to said rotation to force stock downwardly for impact by said vanes, and

(g) valve means in the bottom of said tub for dumping the contents of said tub.

4,593,862

METHOD FOR THE MANUFACTURE OF CHIPS FROM MINERAL, VEGETABLE OR EMBRITTLED MATERIALS AND APPARATUS FOR CARRYING OUT THE METHOD

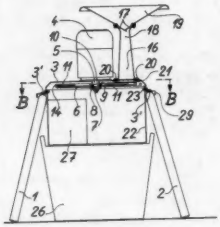
Karl Schaefer, Lechbruck am See; Gottfried Frank-Fahle, Oberursel, and Norbert Gasenzer, Kronberg, all of Fed. Rep. of Germany, assignors to Inter-Wood Maschinen GmbH & Co., Lechbruck am See, Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,251

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342866

Int. Cl.⁴ B02L *13/09*

U.S. Cl. 241—88 **3 Claims**



1. Apparatus for the manufacture of chips from mineral, vegetable or embrittled materials comprising a beater mill having a stationary crushing path extending in a longitudinal direction and a rotating beater rotor carrying beater shoe arms each provided with beater shoes, the stationary crushing path being equipped with replaceable wear plates and striking bars, at least one magazine aligned in the longitudinal direction of the stationary crushing path for supplying replacement wear plates to said stationary crushing path and at least one further magazine arranged in the longitudinal direction of the stationary crushing path for supplying replacement striking bars to said stationary crushing path.

4,593,863

DEVICE FOR CHOPPING UP GARDEN WASTE AND THE LIKE

Johann Mordstein, Deuringen, and Erwin Karg, Neusäss, both of Fed. Rep. of Germany, assignors to Leonhard Schmid KG, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,359

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324274

Int. Cl.⁴ B02C *18/10*

U.S. Cl. 241—92 **5 Claims**

1. A device for chopping up refuse, comprising:

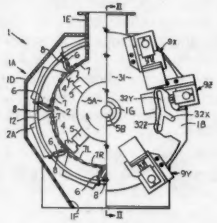
a generally uncovered, level base plate, said base plate having a downwardly formed skirt thereon for reinforcing it;

a pair of spaced apart legs, each leg having a top end to which one side of the base plate is fixed, said base plate assuming its level orientation when fixed to said legs;

an electric motor mounted to said base plate, said electric motor having a drive shaft extending therefrom said drive shaft defining a drive axis;

a support disk supported on said drive shaft for rotation therewith and about said drive axis, said support disk being disposed under said base plate and having a top face and at least one slot formed therein;

at least one knife fixed on said support disk and situated at the back side of said at least one slot viewed in the direction of rotation of said support disk, said knife having a cutting edge situated at a higher level than the top face of said support disk;



means defining a filling passageway, said means being supported on said base plate adjacent to said electric motor and serving as a counter-knife frame for functioning with said at least one knife moving in relation thereto;

further means defining an upright and downwardly open ejection passageway, said further means being fixed on a lower side of said base plate and situated coaxially around said support disk such that said ejection passageway is placed around said support disk with a clearance therebetween sufficient to guard against stoppage of said device; and

a rim running upwards from an outer edge of said support disk.

4,593,864

DIFFERENTIAL MANDREL FOR SHEET-SLITTING MACHINE RECOILER

Sigurd J. Stromme, Holmestrand, Norway, assignor to Årdal Og Sunndal Verk A.S., Oslo, Norway

Filed Jan. 23, 1985, Ser. No. 694,118

Claims priority, application Norway, Jan. 25, 1984, 840274

Int. Cl.⁴ B65H *18/08, 15/24*

U.S. Cl. 242—56.9 **3 Claims**

1. An apparatus for producing evenly and tightly wound rolled coils of strips cut from a coiled sheet of material which is slit parallel to the longitudinal dimension thereof by a slitting machine to form plural said strips, said apparatus comprising at least one recoiler mandrel for coiling thereon said strips, said recoiler mandrel comprising:

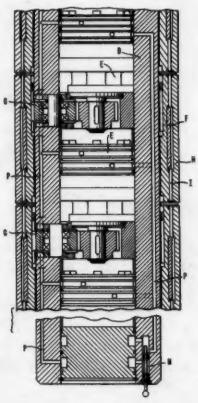
a recoiler shaft;

means for rotating said recoiler shaft in a recoiling direction;

plural independent mandrel sections mounted about said recoiler shaft at positions along the length thereof such that said strips are coiled about respective said mandrel sections, each said mandrel section including an inner drum mounted about said recoiler shaft and having internal teeth; and

means, operably connected between said recoiler shaft and said mandrel sections, to maintain the tensions of said strips being coiled substantially equal by accommodating differences in length thereof, said means comprising plural hydraulic units mounted on said recoiler shaft and connected to respective said mandrel sections and responsive to the tension thereon due to said strips being coiled

thereof, each said hydraulic unit including a pressure side and a suction side, said pressure sides of all said hydraulic units being connected, and said suction sides of all said units being connected, thereby forming a closed hydraulic system wherein increased pressure in one said hydraulic unit due to increased tension on the respective mandrel section is balanced by the remaining said hydraulic units



and respective mandrel sections, each said hydraulic unit having external teeth, and further comprising gear wheels engaging said internal teeth of respective said inner drums and said external teeth of said hydraulic units for transmitting rotational forces therebetween, whereby the sum of rotations of all of said mandrel sections with respect to said recoiler shaft is zero, and the rotational forces of all said mandrel sections substantially are equal.

4,593,865

WINDING MANDREL FOR A COIL OR WOUND PACKAGE FORMED OF FLEXIBLE, SUBSTANTIALLY FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS

Werner Honegger, Tann-Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Sep. 11, 1984, Ser. No. 649,371

Claims priority, application Switzerland, Sep. 19, 1983, 5068/83

Int. Cl.[4] B65H *18/04*

U.S. Cl. 242—67.1 R **30 Claims**

1. A winding mandrel for a coil formed from flexible, substantially flat products, especially printed products, said winding mandrel having a center of gravity and comprising:

a hollow substantially cylindrically annular winding drum;

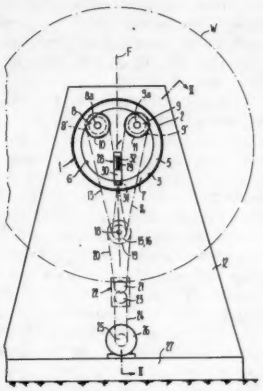
said winding drum having an interior side, an unobstructed interior space, a longitudinal axis and an associated plane;

said plane extending essentially perpendicular to said longitudinal axis and lying outside said center of gravity;

said winding drum including:

at least one annular support member distinct from said interior side for axial support of the winding mandrel;

at least one annular support element distinct from said interior side for radial support of the winding mandrel; and



said at least one annular support element extending along said interior side of said winding drum and being essentially arranged in said plane.

4,593,866

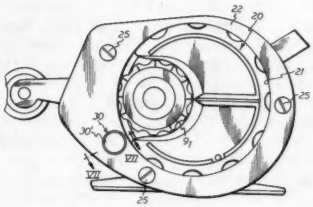
MAGNETIC BRAKE FOR BRAKING THE LINE SPOOL OF A FISHING REEL

Börje Moosberg, Mörrum, and Jarding U. Karlsson, Svängsta, both of Sweden, assignors to Abu Aktiebolag, Svangsta, Sweden

Continuation-in-part of Ser. No. 499,970, Jun. 1, 1983. This application Feb. 8, 1984, Ser. No. 578,371

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—84.52 B **3 Claims**



1. A fishing reel comprising a reel frame, a line spool rotatably mounted in the frame, an induction-type magnetic brake for braking the line spool during casting, said magnetic brake comprising a plurality of magnets each having first and second opposite pole ends, a magnet supporting member having means for supporting said magnets with said first pole ends in spaced relationship along an arc, said first pole ends being positioned in a common plane which is perpendicular to the axis of rotation of said line spool, said reel frame having at one end thereof an opening of sufficient dimension to permit insertion of said line spool axially therethrough into position within said frame, said magnet supporting member and said reel frame having cooperating securing means for releasably securing said supporting member on said frame in a position in which it closes said opening and supports said magnets with said arc of pole ends in a coaxial position relative to the axis of rotation of said line spool, said line spool at one end thereof facing said plane having means rotatable with said line spool at a short distance from said plane for inductive cooperation with said magnets,

said magnet supporting member further supporting adjusting means accessible from the outer side of the fishing reel for adjusting the axial space of said plane relative to said means rotatable with the line spool, said magnet supporting member, when released from said reel frame, being removable from said frame together with said magnets, thereby exposing said opening to permit axial withdrawal and reinsertion of said line spool through said opening,

said magnet supporting member including a cap member having a substantially cylindrical wall member, movable wall means including an annular wall member and an annular magnet supporting plate fixed thereto, said supporting plate comprising a magnet supporting surface of magnetically conductive material for contact with said second pole ends which are facing away from said line spool and said annular wall member having a substantially circular array of pockets arranged to receive and hold said magnets with said second pole ends in contact with said surface, said reel frame having at said one end a circular opening in coaxial alignment with said line spool, the diameter of said opening being sufficiently greater than the maximum diameter of the line spool to permit said axial withdrawal of said line spool therethrough from its position in the reel frame, said cylindrical wall member of said cap member being dimensioned for insertion into said opening, said reel frame in said opening and said cylindrical wall member of said cap member having cooperable engaging means formed to be brought into and out of engagement with each other by rotating said cap member is said opening through a small fraction of a full turn, said engaging means, when in engagement with each other, preventing withdrawal of said cap member,

said cap member being provided with a catch including a spring-biased push-button accessible from the outer side of said cap member, said reel frame in a part thereof adjacent said opening having a bore and said push-button comprising a stem which is slidably mounted in said bore and supports a projecting tab protruding from said stem into said opening, a biasing spring means being mounted to act between said end wall member and said push-button in a direction tending to maintain said movable push-button in an outer end position, said push-button being movable manually to an inner end position against the action of said spring means, a recess being formed in said cylindrical wall portion of said cap member to receive said tab of said catch as soon as the cap inserted into said opening is rotated into an angular position in which said protrusions are engaged with one another, whereby said tab of said catch, when received in said recess prevents removal of said cap member from said opening in the reel frame by preventing rotation of the cap member into a disengaged position of said protrusions in relation to each other until said push-button is depressed to remove said tab from the engagement in said recess.

4,593,867

FILM STORAGE DEVICE IN CAMERA PROCESSOR

Teiichi Yamasaki, and Yutaka Takahashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 16, 1982, Ser. No. 450,176
Claims priority, application Japan, Dec. 22, 1981, 56-206090
Int. Cl.[4] G03B *1/00*
U.S. Cl. 242—181 **2 Claims**

1. A film storage device for a camera processor for storing an exposed film at a location between a developing track and a photographing track, comprising:

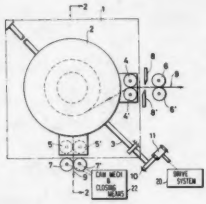
two film storage tracks, each having one reel and a pair of reel rollers;

a rotary shaft interconnecting said reels;

a rotatable supporting member arranged perpendicular to said rotary shaft, said storage tracks being arranged adjacent to each other on both sides of said rotatable supporting member,

means for rotating said supporting member sot that said reel rollers of said storage tracks alternately correspond with said photographing track and said developing track;

means for simultaneously feeding film to one of said tracks and removing film from the other of said tracks;



a first pair of feed rollers for feeding said exposed film from said photographing track to one of said pairs of reel rollers; and

cutter means for cutting said exposed film; and

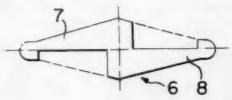
wherein a film inlet and a film outlet of said film storage device can be positioned so as to be displaced from one another by an angle between 90° and 180°.

4,593,868

REEL SPRING OF MAGNETIC TAPE CASSETTE

Takateru Sato, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 323,079, Nov. 19, 1981. This application Oct. 13, 1983, Ser. No. 540,713
Claims priority, application Japan, Jan. 14, 1981, 56-2837
Int. Cl.[4] G11B *23/10*
U.S. Cl. 242—199 **2 Claims**



1. In a magnetic tape cassette, a reel spring made of stamped resilient sheet metal, said reel spring defining, with respect to transverse first and second axial lines crossing at a crossing point, a shape comprising:

an elongated parallelogram having a shorter diagonal coincident with said first axial line and a longer diagonal coincident with said second axial line, whereby said parallelogram is divided into four quadrants by said axial lines;

a first cut-out in said parallelogram, said first cut-out formed in a first said quadrant, said first cut-out extending from the peripheral surface of said parallelogram to at least said second axial line, whereby said first quadrant has an indented shape; and

a second cut-out in said parallelogram, said second cut-out formed in a second said quadrant, said second quadrant being opposite said crossing point from said first quadrant, said second cut-out extending from the peripheral surface of said parallelogram to at least said second axial line, whereby said second quadrant has an indented shape,

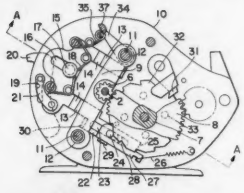
whereby said first and second cut-outs are asymmetric with respect to both said axial lines and are symmetric with respect to said crossing point.

4,593,869

DOUBLE-BEARING FISHING REEL

Kuniharu Yasui, and Kyoichi Kaneko, both of Tokyo, Japan, assignors to Daiwa Seiko Inc., Higashikurume, Japan

Filed Oct. 10, 1984, Ser. No. 660,422
Claims priority, application Japan, Oct. 28, 1983, 58-201981
Int. Cl.[4] A01K *89/015*
U.S. Cl. 242—220 **5 Claims**



1. In a double bearing fishing reel including side plates; a spool shaft mounted between the side plates and including a connection portion; a spool supported for rotation with the spool shaft; handle shaft means coupled with the spool; a drive gear on the handle shaft means; a pinion axially slidably mounted on the spool shaft for meashing engagement with the drive gear; a dead-point utilizing spring; clutch means including a clutch plate and control means, the clutch plate being urged by the dead-point spring for reciprocable sliding movement between a first position in which the pinion engages the connection portion and a second position in which the pinion is caused to be disengaged from the connection portion; and a clutch plate operating member, projecting from one of the reel side plates, for actuating movement of the clutch plate to the second position, the pinion being separated from the connection portion following pressing motion of the clutch plate operating member to effect sliding movement of the clutch plate from the first position to the second position whereby fishing line on the spool may be payed out, and the clutch control means causing engagement of the pinion with the connection portion upon turning of the handle shaft means to effect sliding movement of the clutch plate from the second position back to the first position whereby the fishing line may be rewound on the spool, apparatus for regulating movement of said clutch plate, comprising:

forced-return spring means, provided on said clutch plate, for urging said clutch plate toward said first position with a force which is larger than the force of said dead-point utilizing spring, and

regulator means for controlling the force of said forced-return spring means.

4,593,870

ENERGY ABSORBING COMPOSITE AIRCRAFT STRUCTURE

James D. Cronkhite, Hurst; Thomas J. Haas, Grand Prairie, and Raymond W. Mort, Hurst, all of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.

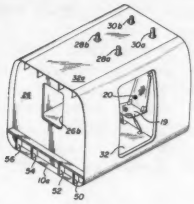
Filed Sep. 9, 1983, Ser. No. 530,987
Int. Cl.[4] B64C *1/06*
U.S. Cl. 244—117 R **6 Claims**

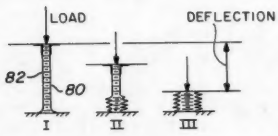
1. An energy absorber which comprises:

thin panel means formed of composite materials for reacting compression forces in the plane of said panel means between first and second opposed edges thereof, said panel means being constructed to resist overall bending failure when force is applied to said opposed edges;

said thin panel means further including a laminate sheet leading by way of a large angle curve portion to a perpendicular flange and with half tube members integrated to the face of said laminate sheet above said flange in a parallel array extending laterally of said laminate sheet; and

force receiving structure for receiving forces directly to said first edge and for receiving forces to said second edge of said panel means with a lateral component to initiate local folding parallel to said second edge for progressive crushing and local folding of said panel mean beginning at said second edge.



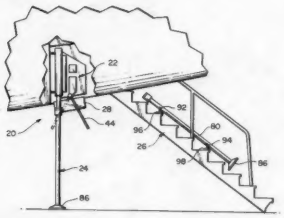


4,593,871

ON-BOARD TAIL JACK ASSEMBLY

Jack E. Nichols, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 497,697, May 24, 1983, abandoned.
This application Jan. 28, 1985, Ser. No. 695,877
Int. Cl.[4] B64D *9/00;* **B64L** *1/22*
U.S. Cl. 244—129.1 **2 Claims**



1. A tail jack assembly for stabilizing an aircraft having a bulkhead in the rear section of its fuselage during a loading or unloading procedure which tends to displace the center of gravity of said aircraft to the rear of the main gear thereof, comprising:

a. a dedicated jack unit adapted to be disposed completely within the tail section of the aircraft and to be accessed through an opening in the belly of the aircraft for transferring loads from the aircraft to the surface on which the aircraft is standing upon stabilizing actuation of said jack unit, said jack unit including a hydraulic cylinder adapted to be mounted on said bulkhead and a ram housed in and rectilinearly extensible with respect to said hydraulic cylinder, said ram having a distal end terminating in a first coupling means; and

b. an elongated strut for bridging said jack unit and the surface on which the aircraft is standing, said strut being detachable from the jack unit for stowage within the aircraft and said strut including shaft means having a proximal end terminating in a second coupling means with

a geometric configuration which is complementary with the configuration of the first coupling means for mating engagement therewith and a distal end which carries a shoe means that is engageable with the surface on which the aircraft is standing and is configured to distribute the jack-supported weight over that surface, and said shaft means including a first shaft member, a second shaft member telescopically housed in the first shaft member, means for fixing said first and second shafts together in any one of a plurality of extended relationships, and means biasing said shafts toward a collapsed relationship and securing the shafts together.

4,593,872

ANCHORING DEVICE FOR POSTS FOR FENCES, GUARD-RAILS, TENTS ETC.

Sven-Eric A. Svensson, Erik Stenbergsgatan 23, S-260 35 Ödåkra, Sweden

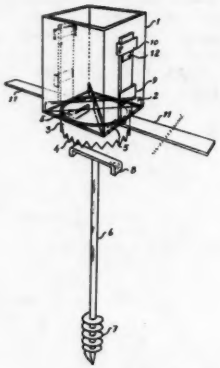
PCT No. PCT/SE84/00198, § 371 Date Jan. 25, 1985, § 102(e) Date Jan. 25, 1985, PCT Pub. No. WO84/04774, PCT Pub. Date Dec. 6, 1984

PCT Filed May 24, 1984, Ser. No. 709,022

Claims priority, application Sweden, May 25, 1983, 8302938

Int. Cl.[4] E04H *17/22*

U.S. Cl. 248—156 6 Claims



1. An anchoring device for a post, comprising:

an elongated anchoring member having a crosspiece at a top end thereof;

sleeve means for receiving a lower end of the post to be anchored, said sleeve means being fluted on an inner portion thereof;

said sleeve means including two intersecting arms forming a barrier to prevent insertion of the post into said sleeve past said barrier; and

cylindrical wall means, fixed to the lower end of said sleeve means, for penetrating the ground and for stabilizing said device, wherein said cylindrical wall means is provided with circumferentially extending serrations and is detachably connected to the crosspiece of said anchoring member;

said anchoring member, said sleeve means, and said cylindrical wall means being adapted to be rotated into the ground.

4,593,873

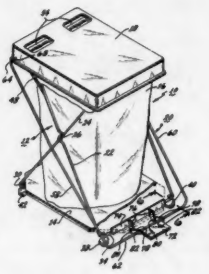
PORTABLE HAMPER WITH FOOT PEDAL OPERATED COVER

Ralph E. Nelson, Newport Beach, Calif., assignor to Winfield Corp., San Diego, Calif.

Filed Mar. 9, 1984, Ser. No. 587,828

Int. Cl.[4] B65B *67/12*

U.S. Cl. 248—98 16 Claims



1. A portable hamper for supporting a pliant bag having sides, a closed bottom and an upper portion having an open top, including,

a frame including means for holding the upper portion of the bag with the top spread open and with the remainder of the bag extending downward from the upper portion,

a cover pivotably mounted at a top position at one end of the frame and with the cover in a first pivotal position covering the open top of the bag and with the cover in a second pivotal position exposing the open top of the bag,

a pedal actuated linkage including a pedal movably mounted to a bottom portion at the other end of the frame and at least one arm extending diagonally across the side of the frame and coupled to the pedal and the cover to provide pivotable movement of the cover from the first position to the second position upon movement of the pedal from an upper position to a downward position, and

the arm including a cross member extending across the bottom of the frame and with the pedal directly attached to the cross member and extending horizontally outward from the cross member and with the pedal linkage including a pivot link extending between and pivotably attached to the frame and the cross member to provide for the pedal remaining in a substantially horizontal position upon movement of the pedal from the upper position to the downward position.

4,593,874

ADJUSTABLE LEGS FOR DESKS AND FURNITURE

Lawrence G. Dunagan, 11023 Telephone Rd., Houston, Tex. 77075

Filed Sep. 27, 1984, Ser. No. 654,969

Int. Cl.[4] A47F *5/00*

U.S. Cl. 248—188.4 12 Claims

1. A set of adjustable legs for raising and lowering desks and other furniture comprising;

open ended elongated square outer tubular members of thin wall metal tubing having attachment means disposed on at least one side wall for attaching said outer tubular members to the side wall of said desks and other furniture,

said outer tubular member enclosed near its top end by a stop plate member having a central aperture,

a mating elongated square inner tubular member of thin wall metal tubing slidably and non-rotatably telescopically received within each said outer tubular member and adapted for vertical movement relative thereto,

said inner tubular member enclosed at its top end by a top

plate member and at its bottom end by an end cap member each having a central threaded aperture,

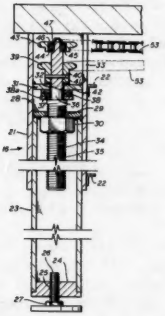
a shaft rotatably disposed within each said outer and inner tubular member for moving said inner member relative to said outer member,

said shaft having an elongated threaded lower portion and a first smooth reduced diameter upper portion defining an annular shoulder therebetween, said lower portion threadedly received within the threaded aperture of said top plate member of said inner member and said first smooth reduced diameter upper portion extending rotatably through said stop plate of said outer tubular member,

bearing means operably disposed on said reduced diameter between said shoulder and the underside of said plate of said outer member,

a drive transmitting sprocket secured to each said shaft for receiving and transmitting rotary motion thereto,

a chain operatively interconnecting each said drive sprocket for rotating each said shaft simultaneously,



rotary drive means connected to said chain for imparting rotary motion thereto whereby rotation of said chain and said shaft moves said inner member vertically along said threaded portion relative to said outer member,

at least one said shaft having a second reduced diameter portion spaced above the first reduced diameter forming a shoulder therebetween and a free turning idler sprocket journaled thereon for rotary motion relative thereto, said chain interconnecting said sprocket for rotating said sprocket indepent of said at least one shaft, and

leveling means threadedly received within the threaded aperture of each said end cap member at the bottom of each said inner tubular member for vertical movement relative thereto for selectively and independently adjusting the height of said inner tubular member relative to the floor to maintain said desks and other furniture in a level position.

4,593,875

TETHERED VEHICLE OPERATOR'S SEAT HAVING WIDE RANGE OF FORE AND AFT ADJUSTMENT

Kevin E. Hill, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

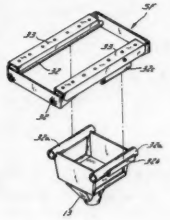
Continuation-in-part of Ser. No. 535,728, Sep. 26, 1983, Pat. No. 4,533,110. This application Dec. 24, 1984, Ser. No. 685,393

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.[4] B60N *1/02*

U.S. Cl. 248—429 **1 Claim**

1. A tethered vehicle operator's seat assembly comprising a seat assembly supporting pedestal, said pedestal having fore and aft extending tubular guide means for fore and aft slidable seat assembly movement, a seat assembly mounted on said pedestal and comprising: a slidable sub-frame having fore and aft extending tubes slidably mounted in said tubular guide means, said fore and aft extending tubes of said slidable sub-frame being about twice as long as said fore and aft adjustment of said sub-frame over a wide range of movement, a fore and aft hook shaped safety stop means operative between said pedestal and said slidable sub-frame, said stop means including flat steel bar stops welded along the side of said tubular guide means, and also including upwardly facing hooks welded to said slidable sub-frame, said hooks engaging said bar stops to



limit relative forward tipping movement of said sub-frame relative to said pedestal when said tether belt means is tensioned excessively and regardless of the position of the slidable sub-frame relative to said pedestal, a seat support frame having an operator's seat, a seat belt for an operator on said seat, and tether belt means connected between said seat and said slidable sub-frame for absorbing the load imposed on said seat belt when a sudden stop occurs and said operator lunges forwardly.

4,593,876

PICTURE STAND FOR SEVERAL PICTURES

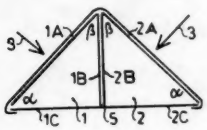
Odin Greiner, Stettbacher Tal 13, D-6104 Seeheim-Jugenheim, Fed. Rep. of Germany

Filed Nov. 5, 1984, Ser. No. 668,072

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340418

Int. Cl.[4] A47G *1/14*

U.S. Cl. 248—469 **9 Claims**

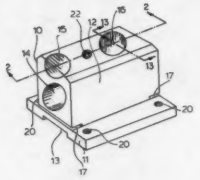


1. A picture stand for simultaneously holding a plurality of pictures, comprising two prisms of transparent material and having an equal size and being of the same rectangular triangular cross-section; and a mount holding said two prisms together, said prisms each having one side wall formed by one cathetus of a triangle and facing and parallel to and spaced from a respective side wall formed by one cathetus of the triangle of the other prism so as to form between the side walls facing each other a space accommodating at least one picture, each prism having a plane surface at the other cathetus thereof and forming a front side of the prism, said two prisms being held by said mount so that the front sides of both prisms are in alignment with each other, said mount overlapping a hypothenuse of each prism so as to form with a respective hypothenuse a space accommodating at least one picture.

4,593,877
FLAG OR BANNER POLE SUPPORT BRACKET

Harry L. van der Wyk, 3885 Fairmeade Rd., Pasadena, Calif. 91107

Filed Oct. 7, 1983, Ser. No. 539,811
Int. Cl.[4] A01K *97/10*
U.S. Cl. 248—512 12 Claims



1. A mounting bracket for mounting on a support surface and for holding one or more supported objects such as a cylindrical pole in a variety of positions comprising:

and elongated body including a base portion and an upstanding body portion;

said base portion and upstanding body portion defining a generally inverted T shape;

said base portion for mounting said bracket on a supporting surface;

said upstanding portion including a plurality of intersecting openings therein at different relative angles with respect to said base portion;

said openings being dimensioned to receive supported objects such as cylindrical poles therein with a supported object which may be mounted by said bracket positioned by the wells defining one opening and extendable into at least part of the remaining openings of said body whereby common object supporting usage of the volume making up the body of the mounting bracket results;

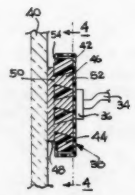
at least one of said openings extending generally parallel to the length of said elongated body;

means for securing such supported objects within respective openings, said base portion including mounting holes therein for directly mounting said base portion on a support surface and transverse strap receiving openings therethrough to allow strap mounting thereof.

4,593,878
ATTACHMENT DEVICE FOR RELATIVELY PERMANENTLY ATTACHING A STRUCTURE TO A SUPPORTING SURFACE

Robert Stewart, Redmond, Wash., assignor to Wink Corporation, Lynnwood, Wash.

Filed Nov. 6, 1981, Ser. No. 319,994
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—549 28 Claims



1. A device for relatively permanent attachment of a member to a supporting surface, said device comprising:

(a) a plastic plate having at least one relatively flat surface thereon and an opposite surface thereon and a plurality of apertures extending between said surfaces,

(b) a bonding layer on said one relatively flat surface of said plastic plate and being rigidly bonded thereo, said bonding layer being formed of a material capable of adhesively bonding to a glass or plastic supporting surface for relatively permanent attachment thereto,

(c) a plurality of generally parallel fracturable pins formed of the same material as said bonding layer and being integral therewith, said fracturable pins extending through said apertures in said plastic plate, said pins being generally perpendicular to said bonding layer and communicating with said bonding layer and having first and second ends with first ends at said bonding layer and the second ends at an opposite surface of said plastic plate, and

(d) a relatively rigid element forming part of said device, said fracturable pins being constructed so that upon application of a high shear force to said device, said pins will fracture at common ones of the ends thereof permitting separation and dis-attachment of at least said relatively rigid element from said supporting surface, said pins being generally closely spaced to one another and present in an amount and relative spacing so that each of said pins will fracture upon application of said high shear force of a predetermined amount, said relatively rigid element being adapted to operatively retain a member to be relatively permanently attached to said supporting surface and which is separated therefrom when said pins fracture.

4,593,879
COMPACT SIGN STAND

James R. Seely, Rochester, and Cecil E. Ursprung, Ann Arbor, both of Mich., assignors to Marketing Displays, Inc., Farmington Hills, Mich.

Division of Ser. No. 442,418, Nov. 17, 1982, Pat. No. 4,548,379.
This application Jul. 3, 1985, Ser. No. 751,561
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—624 25 Claims

1. A sign stand for supporting a sign including at least one cross-brace, said sign stand comprising: a base, a longitudinally-extending generally upright member, connecting means for connecting said upright member to said base, and attaching means for removably securing said sign to said upright member, said base including a plurality of ground-engaging legs thereon, each of said legs being selectively retractable into a shortened configuration or extendable into an elongated configuration, each of said legs further being pivotal between a first position generally parallel to said upright member and a second position generally perpendicular to said upright member, said base further including resilient biasing means for normally biasingly supporting said upright member in a generally vertical position, said resilient biasing means being resiliently yieldable to allow said upright member to pivotally deflect in a generally downward direction in response to first predetermined forces exerted on said sign, said upright member and said base having a combined overall length approximately equal to the length of said legs when in said shortened configuration, said attaching means including channel means

on said upright member for slidably receiving a first portion of the sign cross-brace removably inserted therein in a longitudinally-extending disposition with a second portion of the sign cross-brace being free of, and substantially unsupported by, said channel means in order to allow the sign and at least the substantially unsupported portion of the sign cross-brace to pivotally swing relative to the axis of said longitudinally-extending upright member of said sign stand in response to second predetermined forces exerted generally parallel to the sign.

4,593,880

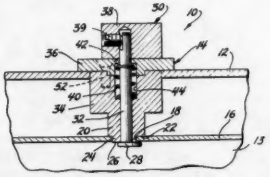
DEVICE FOR SUPPORTING A PREFORM INSERT IN A MOLD

Robert F. Smith, Dover, N.H., and Claude Bemis, York, Me., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation of Ser. No. 465,557, Feb. 10, 1983, abandoned. This application Nov. 23, 1984, Ser. No. 674,440

Int. Cl.[4] B29C *33/12*

U.S. Cl. 249—91 **5 Claims**



1. An insert support assembly for holding an insert in a spaced relationship to an insert support and wherein the insert is a flat plate with opposite surfaces and has a hole therein, the combination of: a spacer body including an alignment portion for piloting the insert and supporting the insert, said alignment portion including a seating surface of a diameter greater than that of said hole, said seating surface engaging the insert on one surface of the insert at the hole in the insert, said alignment portion further including a pin portion having a diameter complementary to that of said hole, said pin portion extensible through said hole, a shaft having an axis eccentric to said hole and extending through said pin portion, said shaft having a round retaining segment thereon with a diameter complementary to that of said hole and having a release position wherein said pin portion, retaining segment and hole are axially aligned for allowing said pin portion to enter said hole, said retaining segment having a locked position wherein said shaft locates said retaining segment to engage the insert on the opposite surface of the insert for holding the insert in spaced position with respect to the insert support.

4,593,881

ELECTRONIC EXPANSION VALVE

Hozo Yoshino, Tokyo, Japan, assignor to System Homes Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 545,157, Oct. 25, 1983, abandoned. This application Sep. 19, 1985, Ser. No. 777,864

Claims priority, application Japan, Oct. 27, 1982, 57-187358

Int. Cl.[4] F16K *47/00*; F25B *41/04*

U.S. Cl. 251—124 **10 Claims**

1. An electronic expansion valve for use in a vapor compression refrigeration cycle to generate a desired pressure difference across a passage of said expansion valve for a given refrigerant mass flow, comprising:

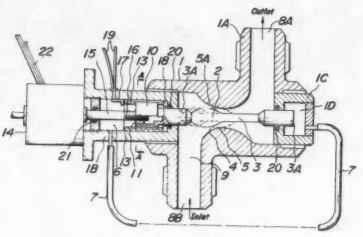
(a) a valve casing having a longitudinal bore;

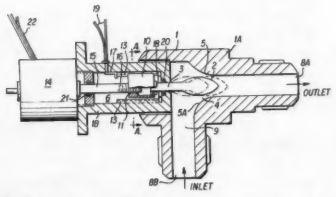
(b) a stepping motor having a threaded output shaft mounted on one end of said valve casing and being driven in a digital fashion;

(c) a motion conversion member housed coaxially inside said valve casing and threadedly coupled to said output shaft of said stepping motor for converting the rotational motion of said stepping motor to an axial motion of said motion conversion member;

(d) a valve pintle fixedly coupled to said motion conversion member to be axially displaced and having pistons at both ends of said valve pintle, said pistons being slidably supported on said valve casing in a coaxial relation with the longitudinal axis thereof;

(e) a valve body formed as an integral part of said valve pintle at an intermediate position thereof and in the form of a spindle; and





(f) a valve seat comprising a part of the surface of said bore inside said valve casing in the form of a venturi and having an outer surface such that when said valve pintle is axially displaced with respect to said valve seat in either direction, the cross sectional area and the shape of the passage defined between said valve seat and said valve body are so varied that the inverse of the orifice area squared has a linear relationship with the stroke of said valve pintle whereby the relationship between the pressure difference across said valve body and said stroke is substantially linear.

4,593,882

ZONE CONTROL VALVE

Michael D. West, Arlington Heights, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,521

Int. Cl.[4] F16K *31/00*

U.S. Cl. 251—243 **18 Claims**

1. An operator for a zone valve comprising:

a frame;

a heat motor supported by said frame;

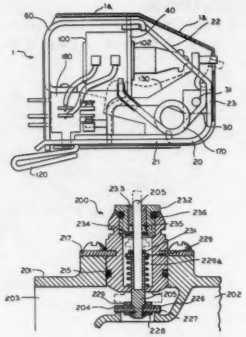
a lever pivotally connected to said frame, said lever having one end positioned to engage a reciprocal valve stem of a valve unit, said motor engaging another end of said lever such that upon actuation of said motor said lever is pivotally moved by said motor to operate said valve unit;

a biasing spring coupled at one end to said frame, said spring having a first arm adapted to slidingly engage said lever;

said lever having a surface adapted to engage said spring arm;

said spring arm having a first bent portion, bent at an angle away from said lever surface such that the external curved surface of said first bent portion opposes said lever surface; and

said lever surface contacting said spring arm adjacent said first bent portion when said lever is in a first position and contacting said spring arm on said first bent portion when said lever is in a second position whereby said spring arm exerts a first biasing force on said lever to oppose a force



exerted by said motor when said lever is in said first position and whereby said spring arm exerts a second biasing force on said lever to oppose the force exerted by said motor when said lever is in said second position, said second biasing force being less than said first biasing force.

4,593,883

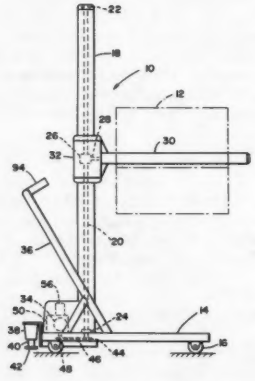
PORTABLE LIFTING, LOADING AND TRANSPORTING DEVICE

Richard P. Nelson, 3455 Crestline Way, Soquel, Calif. 95073

Filed Dec. 10, 1984, Ser. No. 679,708

Int. Cl.[4] B60P *1/10*

U.S. Cl. 254—7 B **9 Claims**



1. A device for lifting and transporting articles from one location to another comprising:

a tubular column with an elongated slot therein;

base means for supporting said column in an upright position and rotatable means attached to the underside of said base means;

a threaded ball screw supported for rotation within said column and a movable nut threadedly engaged with said screw;

motor means mounted on said base means;

drive means for interconnecting said motor means with said ball screw;

means extending transversely from said column for retaining an article to be lifted;

pin means extending through said slot for interconnecting said screw nut and said article retaining means;

support means for enclosing said screw nut and said pin means and for reducing friction on said tubular column due to a load applied to said article retaining means, said support means including a first series of rotatable bearing means for engaging on outer surface of said column and a second series of rotatable bearing means for engaging either edge of opposite side edges of said elongated slot in said column;

whereby rotation of said ball screw by said motor means causes vertical movement of said article retaining means and any article supported thereon relative to said column while said first and second bearing means afford minimal friction on said tubular column irrespective of the load being lifted.

4,593,884

CONTINUOUS-ADVANCE HYDRAULIC CABLE MOVER

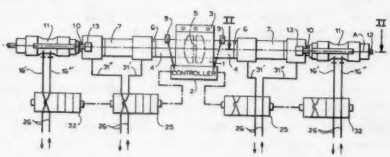
Christian Zschocke, and Hans Forchheim, both of Erdmannsdorf, German Democratic Rep., assignors to Bauakademie der Deutschen Demokratischen Republik, Berlin, German Democratic Rep.

Filed Jan. 24, 1985, Ser. No. 694,642

Claims priority, application German Democratic Rep., Jan. 24, 1984, 259575

Int. Cl.[4] B66F *19/00*

U.S. Cl. 254—264 **8 Claims**



1. A cable mover comprising:

a generally stationary support;

a tube centered on an axis and having a pair of axially opposite ends;

a swivel joint carrying the tube on the support and permitting the tube to move only nonaxially thereon;

respective axially double-acting actuators carried on the tube ends;

respective double-acting grippers carried on the actuators, the cable axially traversing the grippers, actuators, and tube, the grippers each having

two sets of wedge jaws engageable with the cable, one of the sets of each gripper engaging the cable when moved in a first axial direction with respect to the cable and sliding along the cable when moved in a second axial direction, and the other set of each gripper engaging the cable when moved in said second axial direction and sliding along the cable when moved in said first axial direction, and

means including a disabling body displaceable between two end positions and through a central position, the body disabling one of the sets of jaws from engaging the cable in one end position, the other set of jaws in the other end position, and neither set of jaws in the central position; and

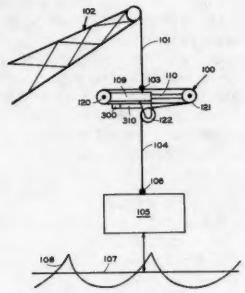
hydraulic control means connected to the actuators and to the disabling means for reversing the actuators and the disabling means in accordance with the position of the actuators.

4,593,885

PORTABLE BALANCED MOTION COMPENSATED LIFT APPARATUS

Donald J. Hackman, Upper Arlington; Don W. Caudy, Sunbury, and Leslie F. Nikodem, Westerville, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Jun. 29, 1984, Ser. No. 626,009
Int. Cl.[4] B66D *1/52, 3/06;* B65G *67/58*
U.S. Cl. 254—277 4 Claims



1. A balanced motion compensated lift apparatus comprising:

a. a hydraulic ram having a hydraulic cylinder with a hydraulic piston slideably fitted therein and having a free end that extends from the cylinder;

b. a hydraulic manifold operatively connected to the hydraulic cylinder;

c. a hydraulic accumulator operatively connected to the hydraulic manifold so that a fluid can pass between the cylinder and accumulator and having an accumulator cylinder with a free moving piston within the cylinder that separates the fluid in the accumulator from a pressurized gas;

d. a first sheave means mounted to one end of the hydraulic cylinder;

e. a second sheave means mounted to the free end of the hydraulic piston;

f. a lift point attachment at the hydraulic cylinder;

g. a third sheave means mounted at the hydraulic cylinder and offset from a center line of the lift point attachment by a distance Y;

h. load line means operatively mounted on the first, second and third sheave means and terminating at a load line connection means; and

i. balancing means of an operatively interrelationship with means a, b, c, d, e, f, g, and h adapted to balance the apparatus, wherein the balancing means are further defined by the following formulas:

$$M_E = X_E(W) - Y(W_E)$$

$$M_C = X_C(W) - Y(W_C)$$

wherein

M_E = moment unbalanced for lightest load

M_C = moment unbalanced for heaviest load

X_E = distance that center of mass is from a lift point under the lightest load

X_C = distance that center of mass is from the lift point under the heaviest load

W = weight of the apparatus

W_E = weight of lightest load

W_C = weight of heaviest load

Y = offset distance, distance that the load line is set off from the lift point.

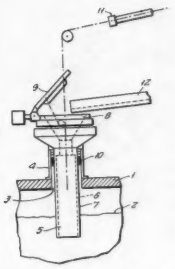
and Y is picked so that M_E and M_C are at a minimum.

4,593,886

METHOD FOR CHARGING LIQUID SLAG TO A CLOSED SMELTING FURNACE

Jan A. Aune, Langhus, and Knut Evensen, Andebu, both of Norway, assignors to Elkem A/S, Norway

Filed Oct. 19, 1984, Ser. No. 662,996
Claims priority, application Norway, Nov. 4, 1983, 834023
Int. Cl.[4] C22B *7/04*
U.S. Cl. 266—44 9 Claims



1. A method for charging slag to a smelting furnace comprising the steps of:

(a) providing a roofed smelting furnace containing slag with a slidable slag launder, said slag launder being positioned in the roof, said slag launder having an upper end above the roof and a lower end below the roof, said upper end having a gas-tight lid and said smelting furnace having furnace gas between the roof and the slag;

(b) lowering said slag launder to a first position, said first position being such that when said slag launder is in said first position the lower end of said slag launder is below the level of slag in said smelting furnace;

(c) opening said gas-tight lid on said slag launder;

(d) charging said furnace with slag through said slag launder;

(e) closing said lid; and

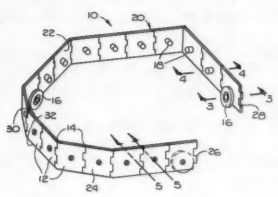
(f) raising said slag launder to a second position, said second position being such that when said slag launder is in said second position, the lower end of said slag launder is above the level of slag in said smelting furnace.

4,593,887

CUTTING TORCH GUIDE

Carl Peterson, 7456 Main St., Niles, Ill. 60648

Filed Jun. 14, 1985, Ser. No. 744,531
Int. Cl.[4] B23K *7/04, 7/10*
U.S. Cl. 266—48 12 Claims



1. A cutting torch guide comprising,

a linear strip pivotable about first axes in the width direction, and distributed along the length of the strip,

the strip being rigid in directions about second axes perpendicular to the first axes and to said width direction, and

means for securing the strip to an object to be cut,

the strip when applied to the object forming at least one edge defining a guide edge lying in a plane perpendicular to said first axes.

4,593,888

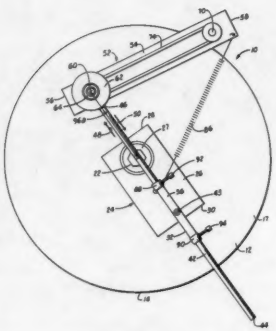
ADJUSTABLE PATTERN

Robert L. Gilson, 3420 Hickory Ridge, Edmond, Okla. 73034

Filed May 1, 1985, Ser. No. 729,307

Int. Cl.[4] B23K *7/10*

U.S. Cl. 266—70 **13 Claims**



1. An adjustable pattern adapted to be utilized with a cutting machine having a drive motor with a drive motor output shaft and a cutting element associated with the drive motor so the cutting element follows a cutting path generally following movement of the drive motor, the adjustable pattern comprising:

a support post for connecting the adjustable pattern to the cutting machine;

a first drive post having a drive end connectable to the drive motor of the cutting machine;

a second drive post spaced a predetermined distance from the first drive post;

means connecting the first and the second drive posts so that rotational movement of the first drive post rotatingly drives the second drive post; and

means for selectively varying the distance between the first drive post and the center of the support post thereby selectively varying the cutting path diameter defined by the movement of the first drive post as the second drive post moves along a pattern path, the first drive post being rotatingly driven by the drive motor of the cutting machine.

4,593,889

LAMINATED TUBULAR LINK

Steven L. Odobasic, 2885 Aurora Ave., #16, Boulder, Colo. 80303

Continuation-in-part of Ser. No. 412,095, Aug. 27, 1982, Pat. No. 4,521,003. This application Jul. 8, 1983, Ser. No. 511,955

Claims priority, application United Kingdom, Mar. 18, 1983, 8307487

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.[4] B60G *11/18;* **B64C** *27/48;* **F16F** *1/14*

U.S. Cl. 267—57.1 A **71 Claims**

1. For use in providing an axially and flexurally stiff and torsionally resilient connection between adjacent structural members, a link comprising: at least one open section member having a predetermined transverse cross-sectional configuration at least partially encircling a longitudinal axis, said open section member having longitudinal edges separated from one another along said axis and having end edges at opposite ends thereof, mounting means at axially-spaced locations adjacent to opposite ends of said open section member for permitting torque to be applied thereto by said structural members, and means carried by said open section member intermediate its ends for stabilizing said transverse configuration of said open section member under various loads, said stabilizer means permitting said longitudinal edges to move relative to one another when torque is applied to said open section member about said axis by said structural members, said mounting means engaging said open section member with respect to its end edges and its longitudinal edges to permit said end edges to warp substantially freely with respect to a plane orthogonal to said axis during said torque application.

4,593,890

DOUBLE ACTING OLEO PNEUMATIC SHOCK ABSORBER

Jan D. van der Laarse, Kievitstraat 10, 2406 Ev Alphen a/d Rijn, Netherlands

Filed Dec. 12, 1983, Ser. No. 560,185

Claims priority, application Netherlands, Dec. 10, 1982, 8204790

Int. Cl.[4] F16F *9/08, 9/342*

U.S. Cl. 267—64.25 **3 Claims**

1. A shock absorber comprising:

(a) an elongated tubular element, said elongated tubular element being closed at one end, and

(b) a piston disposed in said elongated tubular element at the other end, said piston being configured and dimensioned to move in said tubular element, said piston defining a space inside said elongated tubular element, said space being divided into:

(i) a high pressure chamber defined at one and of said space closed by a first movable separating element;

(ii) a stop element against which said first movable separating element can come to rest;

(iii) a fluid chamber at the other end of said space divided into at least two sections;

(iv) a restricting element for separating said fluid chamber into said two sections;

(v) a second movable separating element functioning as a piston for closing said fluid chamber; and

(vi) a low pressure gas chamber positioned between the first and second movable separating elements, said shock absorber operating between a completely expanded position and a completely compressed position; said first separating element being configured to be at rest against said stop element thereby completely closing the high pressure gas chamber and said second

separating element being configured to move during a first motion phase in a direction toward said first separating element until both separating elements contact each other, both separating elements being configured and dimensioned to move together during a second motion phase, the first movable separating element thereby leaving said stop element and further being configured to provide a connection between said high pressure gas chamber and said low pressure gas chamber during the transition from the first to the second motion phase, and further comprising only one valve to supply gas to said high and low pressure chambers, said first movable separating element comprising means for operating an external deflection indicating means.

4,593,891

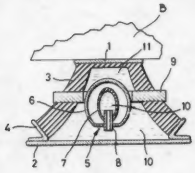
VIBRATION-ABSORBING MOUNTING DEVICE WITH HYDRAULIC DAMPING, ESPECIALLY FOR ENGINES

Shuichi Okamoto; Motoo Kunihiro, both of Tsu, and Zenji Nakajima, Okazaki, all of Japan, assignors to Kaisha Toyota Jidosha Kabushiki, Aichi and The Toyo Rubber Industry Co., LTd., Osaka, both of, Japan

Filed Nov. 28, 1983, Ser. No. 555,902

Int. Cl.[4] F16M *1/00*

U.S. Cl. 267—140.1 **5 Claims**



1. A vibration-absorbing engine mounting device with hydraulic damping, comprising:

an upper mounting means;

a lower mounting means;

a resilient wall means interposed between said upper and lower mounting means, said wall means having an upper portion and a lower portion firmly and air-tightly bonded to said upper mounting means and said lower mounting means, respectively;

a ring-shaped mass damper transversely and air-tightly provided in said resilient wall means at an intermediate portion thereof;

means defining a closed chamber enclosed by said mounting means, and resilient wall means and said mass damper;

capsule means including a sealed exterior rigid case oriented wholly inside said closed chamber means;

an inflatable and deflatable sealed bag capable of changing its volume by expansion or contraction, said bag being wholly encased in said sealed rigid case;

a volume of gas sealed between said sealed bag and said rigid case;

an orifice member in said sealed bag and extending through said sealed rigid case to said closed chamber means, the interior of said sealed bag communicating with said closed chamber by way of said orifice member, said sealed bag and said closed chamber being filled with a damping fluid, the rate of fluid exchange between the interior of said sealed bag and said closed chamber being controlled by a throttle effect of said orifice member, whereby the combination of said resiliency of said resilient wall and said throttle effect of said orifice member provide the vibration-absorbing characteristic of said engine mounting means; and

wherein said rigid case is oriented in said closed chamber so as to be wholly surrounded by said damping fluid.

4,593,892

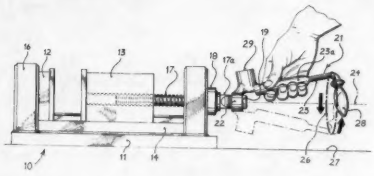
QUICK CLOSING VISE ASSEMBLY FOR MILLING MACHINE

Theodore E. Terstegge, 103 Tara Rd., Orinda, Calif. 94563

Continuation-in-part of Ser. No. 429,225, Sep. 30, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 642,151

Int. Cl.[4] B25B *5/10*

U.S. Cl. 269—244 **3 Claims**



1. In a vise assembly comprising a base, a pair of jaw members, one of said members being fixed with respect to said base, the other said member being movable between advanced and retracted positions with respect to said one member, an elongate vise screw threadedly coupled at one end to the other said member for moving the other said member between advanced and retracted positions in response to rotation of said screw, the other end of said screw being formed with a plurality of flats forming a drive nut portion thereof, said base being adapted to rest upon a support surface, said support surface being spaced from the axis of said screw and drive nut portion, and operating means for rapidly rotating said vise screw, said operating means having an annular head of rigid material, a socket formed within said head to include a plurality of flats corresponding to the first named flats, said socket receiving said drive nut portion in a manner supporting said operating means therefrom, a handle including an elongate shank rigidly fixed to said head for rotating said socket, said handle extending diagonally away from the axis of said screw, the free end of said handle overlying the support surface, said handle when carried by said drive nut portion being rotatable continuously through 360° while the free end remains above said support surface to permit uninterrupted continuous rotation of said socket and handle for rotation of the vise screw.

4,593,893

METHOD AND APPARATUS FOR SEQUENTIALLY ADVANCING AND CUTTING FORMS FROM TWO CONTINUOUS FORM-WEBS

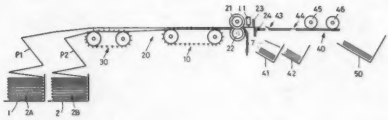
Walter Suter, Ringlikerstrasse 39, CH-8142 Uitikon, Switzerland

Filed Mar. 29, 1985, Ser. No. 717,986

Claims priority, application Switzerland, Mar. 30, 1984, 1634/84

Int. Cl.[4] B65H *41/00*

U.S. Cl. 270—52.5 **13 Claims**



1. A method of sequentially advancing, cutting and sorting forms attached together serially in two single-path form-webs in which the forms carry a code to identify forms to be assembled together by sorting, comprising the following consecutive steps:

(a) introducing the two webs in a superposed state and with an at least partial lateral overlap to a cutting table such that a perforated margin on each web is situated along

opposite external edges when viewing the two superposed webs together;

(b) engaging each web solely at said perforated margin by tractor means on said cutting table and advancing each web on said cutting table by a perforated margin solely along one longitudinal web edge;

(c) transversely severing the forms from the web by a transverse cutter of the cutting table; and

(d) sorting and assembling the forms as a function of the code thereon.

4,593,894

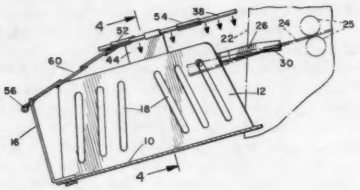
AIR ASSIST DELIVERY SYSTEM

Kenneth D. Woods, 3158 Aurora Vista Dr., Spring Valley, Calif. 92077

Continuation of Ser. No. 032,556, Apr. 23, 1979, abandoned. This application May 18, 1981, Ser. No. 264,286

Int. Cl.[4] B65H *29/38*

U.S. Cl. 271—177 **11 Claims**



1. A sheet delivery stacking system comprising in combination:

a sheet receiving chute disposed for receiving individual flat rectangular sheets moving in succession from a machine;

support means for engaging and supporting the side edges of a sheet during movement of said sheet toward and at least partially into the chute, and

air pressure means for applying a continuous force of air to the upper surface of said sheet while supported by said support means during movement into said chute for bending said sheet about its longitudinal axis for providing longitudinal support thereof and for rapidly forcing said sheet into said chute out of the way of succeeding sheets.

4,593,895

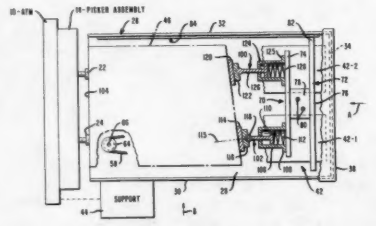
AUTOMATICALLY ADJUSTING CURRENCY PUSHER PLATE APPARATUS

Kimbrough I. Myers, Dayton; Carl C. Blau, West Carrollton, and Richard P. Taylor, Xenia, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 6, 1984, Ser. No. 597,339

Int. Cl.[4] B65H *1/08, 1/02*

U.S. Cl. 271—148 **10 Claims**



1. A container for receiving a stack of sheets having a front end and a rear end; said container having a dispensing end and also comprising:

means for supporting said stack of sheets in said container; and

means for moving said stack of sheets towards said dispensing end as a first sheet at said front end is removed therefrom;

said moving means comprising:

a first member positioned at said rear end when said stack of sheets is positioned in said container;

at least one second member for contacting said rear end of said stack of sheets; and

means for resiliently coupling said second member with said first member to enable said second member to resiliently urge said stack of sheets towards said dispensing end;

said coupling means including a first element having a point therein; and also including a second element secured to said second member and cooperating with said first element to enable said second member to change position relative to said first element while contacting said rear end and while an imaginary line that is perpendicular to said second member passes through said point.

4,593,896

STACKING APPARATUS FOR PAPER SHEETS

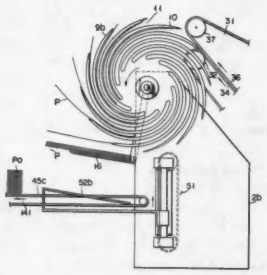
Kunihiko Nakamura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 29, 1984, Ser. No. 594,897

Claims priority, application Japan, Mar. 31, 1983, 58-53781

Int. Cl.[4] B65H *29/40, 33/16, 31/32*

U.S. Cl. 271—186 **3 Claims**



1. A paper sheet stacking apparatus for dividing continuously fed paper sheets into regular sheaves each consisting of a predetermined number of paper sheets, said paper sheet stacking apparatus comprising:

(a) blade wheel means rotating about a substantially horizontal axis of rotation, said blade wheel means having a plurality of blades extending from the central portion of the outer periphery thereof in the direction opposite to the rotating direction thereof, each two adjacent blades defining therebetween a space having an opening on the outer periphery of the blade wheel means;

(b) feeding means for continuously inserting the paper sheet into the spaces, one for each space, through the openings of the blade wheel means passing a predetermined accepting position;

(c) stationary stop means adapted to abut against the paper sheets held in the spaces and rotating together with the blade wheel means, thereby stopping the rotation of the paper sheets, so that the paper sheets are discharged from the spaces of the blade wheel means and dropped automatically;

(d) main stacking means for receiving and bearing thereon the paper sheets discharged from the blade wheel means;

(e) separator means rotatably supported in a substantially coaxial relation with the blade wheel means and capable of receiving the dropped paper sheets, said separator

means having an arm portion extending in the radial direction of the blade wheel means along at least one side thereof, and a receiving portion for receiving the dropped paper sheets, said paper sheets dropped from the blade wheel means being adapted to be stacked on the receiving portion when said separator means is brought to a first position which is close to the blade wheel means and is rotated to reach a receiving position where the receiving portion receives the dropped paper sheets;

(f) a rotating mechanism for rotating the separator means;

(g) separator drive means for moving said separator means to said first position or to a second position which is on the side of the blade wheel means and at which the separator means is kept from contacting the paper sheets dropping from the blade wheel means;

(h) auxiliary stacking means for transferring the paper sheets on the receiving portion of the separator means to the main stacking means; and

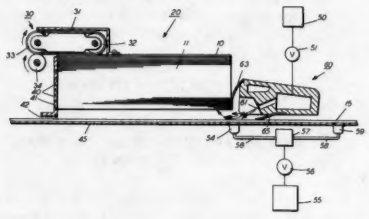
(i) control means for controlling the rotating mechanism and the separator drive mechanism so as to rotate the separator means when the separator means has been moved to the first position and stopping in a stand-by position which is beyond the accepting position as viewed along the rotating direction of the blade wheel means, to stop the separator means at the receiving position of the separator means so that the receiving portion of the separator means is brought to the first position before the first paper sheet out of the sheaf is dropped from the blade wheel means, to drive the auxiliary stacking means so that the auxiliary stacking means supports the paper sheets in place of the receiving portion after the separator means starts receiving the paper sheets, to stack the paper sheets discharged from the blade wheel means on the auxiliary stacking means, and to rotate the separator means to the stand-by position after moving the separator means having so far been at a standstill from the first position to the second position and then move the separator means again to the first position.

4,593,897

BOTTOM STACKING WITH AIR KNIFE LEVITATION AND ARTICULATING SEALS

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 27, 1984, Ser. No. 654,703
Int. Cl.[4] B65H *31/08*
U.S. Cl. 271—212 **11 Claims**



1. A bottom sheet stacking apparatus, comprising:

a sheet tray adapted to receive a stack of sheets, said tray including a feed belt means for forwarding sheets into said tray and rear and side wall means that form an air tight seal around the stack of sheets, said rear wall serving as a registration edge for incoming sheets into the tray;

air knife means located adjacent the front of said tray, said air knife means being adapted to float all sheets located within said tray;

deflectable articulating seal means forming a front wall of said tray and adapted to positively seal the area of the sheet stack adjacent said air knife when said air knife is actuated; and

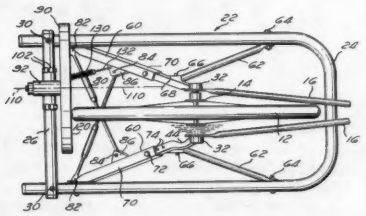
vacuum port means located adjacent said feed belt means a minimal distance before the front edge of the sheet stack, said vacuum port means being adapted to pull sheets against said feed belt means as they are forwarded by said feed belt means toward said rear wall of said tray until their trail edges pass said vacuum port means, thereafter the sheets are forced up against the floating stack of sheets by said air knife means.

4,593,898

BICYCLE EXERCISING MEANS AND METHOD

Carl M. McLerran, 4816 Summers La., Klamath Falls, Oreg. 97603, and Robert E. Johnson, 2890 Woodridge Cir., Carlsbad, Calif. 92008

Filed Jun. 25, 1984, Ser. No. 624,454
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—73 **15 Claims**



1. Exercising apparatus disposed on a supporting surface and supporting the rear axle of a bicycle and said exercising apparatus producing drag by connection to the bicycle rear tire, comprising:

(a) a stand adapted to support said rear tire in a manner so that said rear tire is free to rotate above said supporting surface, said stand adapted to support said rear tire by detachable connection to said rear axle,

(b) a flywheel and flywheel support means connected to said stand and supporting said flywheel to rotate transverse of the longitudinal axis of said bicycle, said support means locating said flywheel so that the side of said flywheel is located to directly contact said rear tire whereby when said rear tire is rotated said flywheel is rotated as the sole means to produce drag on said rear tire,

(c) said support means adjustably supporting said flywheel so that the axis of rotation of said flywheel can be adjusted to various distances from the central vertical plane of said rear tire to thereby vary drag, and

(d) said support means including means for pressing said flywheel to said tire for traction.

4,593,899

EXERCISE JUMPING ROPE

Robert A. Miller, P.O. Box 4500, Laguna Beach, Calif. 92652

Continuation-in-part of Ser. No. 148,244, May 9, 1980, Pat. No. 4,489,934. This application Sep. 17, 1984, Ser. No. 651,539
Int. Cl.[4] A63B *5/20*
U.S. Cl. 272—75 **9 Claims**

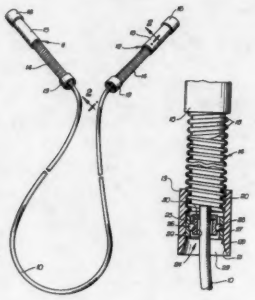
1. An exercise jumping rope construction consisting of a rope coupled at each end thereof to a respective handle assembly, each handle assembly comprising:

(a) a terminal coupling comprising an enclosed hollow member having a first and second end, the inner surface of the first end of said terminal coupling being tapered outwardly to form a constantly increasing diameter at the first end thereof;

(b) a cylindrical gripping member;

(c) resilient extension means for imposing force upon the

user in relation to the rate of rotation of the rope, said resilient extension means comprising a substantially cylindrical resilient member adapted to resiliently flex along its longitudinal axis upon the imposition of force by the rope at the terminal coupling, said resilient member having a first and second end, the first end thereof being coupled to said cylindrical gripping member in axial abuttment therewith, the second end being axially joined at the second end of said terminal coupling; and



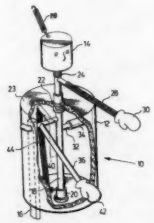
(d) a ball bearing assembly secured within the hollow interior of the terminal coupling substantially adjacent the first end of said terminal coupling, the ball bearing assembly including ball bearings, a race and a ball bearing housing secured to the interior surface of said terminal coupling, said ball bearing assembly having an inner race defining an opening at its center for attachment of the rope therethrough.

4,593,900

BOXING ROBOT

Thomas J. Burke, 261 Medina Drive, Keswick, Ontario, Canada (L4P 1H3)

Filed Feb. 15, 1985, Ser. No. 702,129
Claims priority, application Canada, Feb. 16, 1984, 447619
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—76 **5 Claims**



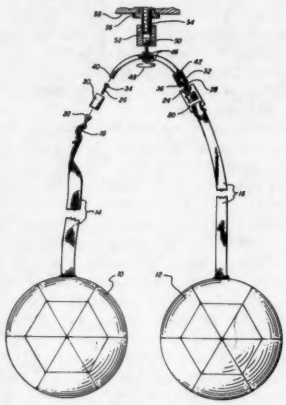
1. A robot for a boxer comprising: a figure simulating a boxer; an upper arm mounted to said figure for horizontal rotation; a lower arm mounted for vertical reciprocation from a lower to an upper position; and means for coordinating the movement of said upper arm relative to said lower arm such that said upper arm is in front of said figure at the same time as said lower arm is at said lower position and said upper arm is behind said figure at the same time as said lower arm is at said upper position.

4,593,901

DUAL-SUSPENSION STRIKING BALLS

Ryan C. Moore, Rte. 49, Box 157, Bernhards Bay, N.Y. 13028, and Daniel P. Smith, 217-C Kibbie Lake Rd., Constantia, N.Y. 13044

Filed Aug. 1, 1985, Ser. No. 761,555
Int. Cl.[4] A63B *69/22*
U.S. Cl. 272—78 **10 Claims**



1. Game or exercise apparatus of the type having freely suspended portions for striking by the hands or feet, said apparatus comprising, in combination:

(a) a pair of striking members for forcible contact by hands or feet;

(b) a pair of elongated, elastic strips fixedly connected at one end of each to respective ones of said striking members;

(c) a pair of support members to which the other ends of said strips are respectively connected for selective adjustment of the length of said strip between said support and striking members;

(d) an arm having opposite, spaced ends;

(e) a pair of first members connecting said support members respectively to said opposite ends of said arm for universal, pivotal movement with respect thereto,

(f) a fixed, overhead support; and

(g) a second member connecting said arm, at a position intermediate of said opposite ends, to said overhead support for universal, pivotal movement with respect thereto.

4,593,902

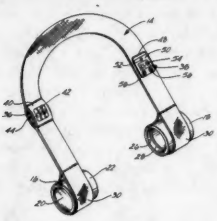
EXERCISE DEVICE

Randolph C. H. Michaelsen, 2168 Mt. Shasta Dr., San Pedro, Calif. 90731

Filed Aug. 10, 1984, Ser. No. 639,453
Int. Cl.[4] A63B *23/00*
U.S. Cl. 272—93 **3 Claims**

1. An exercise device comprising an elongate flexible strap member of selected length defining at each of a pair of opposite ends a loop of selected inner girth, a pair of cylindrical members sized in diameter to be snugly, yet removably received in a corresponding one of the strap member end loops and to be sufficiently large to prevent their passage between the bottom of a door and an adjacent floor surface, the strap member being sufficiently long between its end loops that when the cylindrical members are present in the end loops and the center portion of the strap between the ends is passed below a door from one side of the door and the enlooped cylindrical members abut against the one side of the door, there is provided on the other side of the door a loop of the strap member into which a person can comfortably yet relatively snugly place his feet with the

loop generally engaged with the instep portions of the feet, whereby the device in cooperation with the door serves as a foot hold-down for aiding in the performance of sit-ups and similar exercises, the cylindrical members being hollow with



sufficient space therein to receive the strap and each having at least one opend end, one open end of one cylindrical member being matable with one open end of the other cylindrical member to define a container for the strap member.

4,593,903

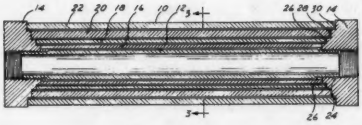
VARIABLE WEIGHT EXERCISING DEVICE

Larry D. Waitz, 182 Earle Ave., Lynbrook, N.Y. 11563

Filed Aug. 12, 1983, Ser. No. 522,803

Int. Cl.[4] A63B *11/02*

U.S. Cl. 272—122 **3 Claims**



1. An exercising device comprising:

an elongated member;

end caps removably secured to both ends of the elongated member, said end caps having a plurality of concentrically stepped annular rims on the medial face of the end cap concentric with the longitudinal axis of the elongated member; and

a plurality of concentric tubular weights, each weight having a length and diameter fixed so that the ends of the weight are engaged and secured by the annular rims on the medial faces of each of the end caps.

4,593,904

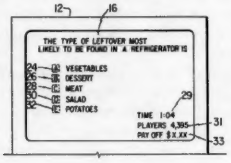
PLAYER INTERACTIVE VIDEO GAMING DEVICE

Gordon T. Graves, Dallas, Tex., assignor to Syntech International, Inc., Dallas, Tex.

Filed Mar. 19, 1984, Ser. No. 591,209

Int. Cl.[4] A63F *9/18*

U.S. Cl. 273—1 E **11 Claims**



1. A two-way video entertainment apparatus for accomodating a plurality of players at different remote locations, comprising:

a central receiving and processing station;

a plurality of remote display units;

a two-way data link connecting said central station to said remote display units;

said remote display units each having:

means for receiving prompting data from said data link, said prompting data comprised of a query portion indicating a question in a predetermined category and a response portion indicating a select group of correct answers for the question,

means for displaying said prompting data,

means for inputting a response from a player to the displayed prompting data, the response being one of the select answers,

means for transmitting said response to said central station over said data link, and

means for indicating a winning response to the player; said central processing station having:

means for generating said prompting data and transmitting said prompting data onto said data link for reception by all of said remote display units,

means for receiving said responses from said remote display units through said data link;

means for comparing said responses from all of said remote display units to determine the winning response, the winning response being a predetermined function of the responses received from all of said remote display units that return responses such that each player is playing against the remaining players, the selection of any of the answers by the player having an unknown selection probability, and

means for transmitting a winning response signal to said remote display units that is indicative of the winning response, said winning response transmitting means operable to activate the winning response indicating means in the ones of said remote display units which received the correct response from the player at that location.

4,593,905

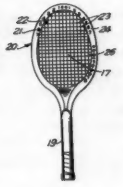
RACQUET STRINGING SYSTEM WITH STRING TENSION INDICATING MEANS

Jack Abel, 1100 NW. 20 Ave., Delray Beach, Fla. 33445

Filed Jan. 27, 1984, Ser. No. 574,368

Int. Cl.[4] A63B *51/12*

U.S. Cl. 273—73 D **9 Claims**



1. A racquet and string assembly comprising a frame, a head portion and a handle portion on said frame, a plurality of opposed spaced bores traversing the head portion, enlarged recessed portions at the outer ends of each of said bores, a plurality of spaced individual strings of substantially uniform

outside diameter secured at each end thereof within the bores and disposed vertically and horizontally across the racquet head to form a web, outwardly extending string securing thread means integral with said strings on at least the ends thereof, at least some of said strings having a series of spaced markings thereon whereby tension applied to said strings will increase the distance between said markings so as to provide a means for measuring the tension in said strings, said markings being located at least on those portions of the strings that form the geometrical center of said web, and internally threaded string retaining means threadably engagable with the string securing means and receivable within the enlarged recessed portions of the racquet bores to hold the strings at a desired tension without reducing the outside diameter of said strings.

4,593,906

SURFACE GAME PROJECTILE MANIPULATING DEVICE

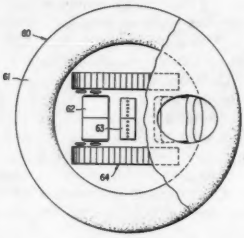
Devendra N. Sharma, 22, Carroll House, Gloucester Terrace, London W2 3PR, Great Britain

Continuation of Ser. No. 188,129, Sep. 17, 1980, abandoned. This application Mar. 28, 1983, Ser. No. 477,840

Claims priority, application United Kingdom, Sep. 17, 1979, 7932145

Int. Cl.[4] A63B *71/00*

U.S. Cl. 273—129 R **9 Claims**



1. Apparatus for sports and games comprising:

a defined playing area upon which the sports and games are conducted comprising a smooth surface defining a slippery and level upper layer and a solid under layer, said under layer being at least partially composed of iron, said playing area being enclosed by a protective barrier;

at least one self-powered vehicle having a generally circular or oval configuration and a bottom resting on and capable of sliding on said slippery upper layer;

a resilient collision bumper extending completely around the perimeter of said vehicle;

propelling and steering means, acting relative to said under layer, for unidirectionally propelling and steering said vehicle as said bottom slides upon said upper layer, said propelling and steering means being controllable by an operator and being carried by said vehicle substantially centrally thereof, said steering means comprising at least one electromagnetic wheel mounted at the bottom of the vehicle, capable of magnetically interacting with the playing area.

4,593,907

POLYHEDRAL AND SPERICAL CUBIC PUZZLES

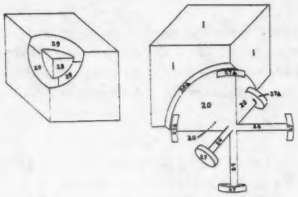
Ibrahim K. Abu-Shumays, and Mary D. Abu-Shumays, both of 1248 Varner Rd., Pittsburgh, Pa. 15227

Filed Jul. 2, 1982, Ser. No. 394,869

Int. Cl.[4] A63F *9/08*

U.S. Cl. 273—153 S **20 Claims**

1. A sub-structure in the form of a sub-puzzle comprising eight external sub-structures stacked in the form of a large structure, wherein the first of said sub-structures having an extended internal cubic section; said extended cubic section having one corner extending a small distance beyond the center of the sub-puzzle and having three surfaces of equal distances from the center of the sub-puzzle; each of said three surfaces terminates by a narrow spherical strip of small width having a fixed radius R from the center of the puzzle; the end of each edge of the extended internal cubic section away from the center of the sub-puzzle is extended further by adjoining to it an edge guiding member which is a portion of a spherical shell; said spherical shell having an outer surface at a distance R from the center of the sub-puzzle; the corner of each of the three plane faces of said extended cubic section is further extended by a rod pivot oriented orthogonal to the surface and having a shell-like guiding member at its extremity; said guiding member having a small thickness and having an outer surface at a distance R from the center of the sub-puzzle; each



of the remaining seven of said eight external sub-structures having a recessed cubic portion, said recessed cubic portion having one corner and three orthogonal surfaces, each surface extending up to a spherical groove, the center of the spherical surfaces of said groove being the center of the sub-puzzle, the width of the groove is slightly more than the width of the spherical shell heads of the rod pivots and the edge guiding members, and the outside surface of the groove is at a distance R from the center of the sub-puzzle; in the assembled form the six guiding members, three at the extremities of the three rod pivots and three at the outer edges of the extended cubic section of the first sub-structure, lie in the grooves of the remaining seven sub-structures thereby preventing disassembly of the sub-puzzle and making possible selective rotations in selective directions.

4,593,908

GEOMETRIC PUZZLE

Baky B. Ibrahim, 11496 Drop Rd., North Huntingdon, Pa. 15642

Filed Jun. 21, 1982, Ser. No. 390,194

Int. Cl.[4] A63F *9/08*

U.S. Cl. 273—153 S **4 Claims**

1. In a geometrical puzzle having a core of eight similar core blocks each of which is movable about a common focus in combination with three other ones of said core blocks, two of which are contiguous therewith and one of which is non-contiguous therewith, the improvement comprising:

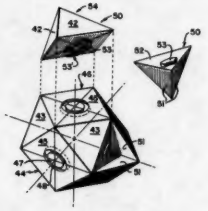
each said core block having an exposed portion with plane surfaces of which at least three said surfaces cooperate each with at least one similar surface of another one of said core blocks to define a plane surface having radial symmetry and being normal to an axis passing through said focus;

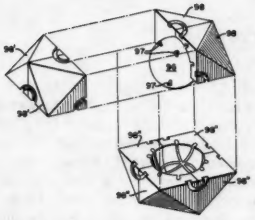
plural groups of similar pyramid blocks pivotally engaged with each said plane surface; mounting means for each of said pyramid blocks permit rotation of each said group of pyramid blocks about an axis which is normal to said plane surface; said mounting means further permitting rotation of four of said core blocks about any of three mutually perpendicular radial axes of said device without moving any of said pyramid blocks relative to the abutting core blocks;

said device having an overall radially symmetrical shape.

4. A connection for a 2×2×2 geometric puzzle comprising eight core blocks including seven movable core blocks and one fixed core block and a core member,

said core member comprising a sphere having seven radially extended pegs, one each at seven of the eight corners of the inscribed cube of said sphere;





said core member being secured to said core block;

each said movable core block having a spherical inner surface corresponding to the said sphere and having three circular arc grooves, each adapted to engage any one of said pegs, said grooves being in the circle of intersection of said sphere and the six surfaces of the included cube of said sphere.

4,593,909

GOLF CLUB SWING TRAINING DEVICE

John Anselmo, 3818 S. Sycamore, Santa Ana, Calif. 92707, and William A. Blatnik, 5412 Scrivener, Long Beach, Calif. 90808

Filed Feb. 16, 1984, Ser. No. 580,714

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—188 R **11 Claims**

1. A golf swing training aid suitable for use by the novice and by the experienced golfer comprising:

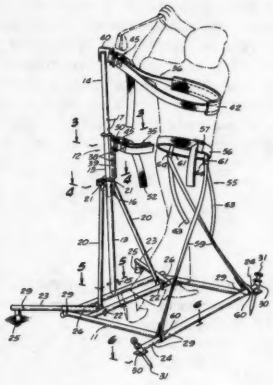
rigid upright support means positionable behind the back of the golfer and having a height free of interference with a golf club swing;

flexible loop means sufficiently large to form an elongated loop sized to loosely embrace the golfer's torso within the larger forward half thereof with the rearward half thereof unoccupied and nonslidably attached to said support means and which loop means is normally taut while the golfer is executing a golf swing;

said loop means being adapted and effective (1) to permit the player's torso to rotate clockwise through a limited arc within said loop means and (2) to permit the torso to swing bodily clockwise in an arc centered at the anchorage of said loop means to said support means thereby to maintain the axis of the player's torso substantially upright and free of appreciable rise and fall during the golf swing;

said support means including a plurality of vertically spaced-apart elongated slots, one end of said adjustable loop means being adapted to be flattened with the free end thereof threaded through a selected one of said slots, then through a slot at one end of a releasable clamp device attached to said loop means and then back through said selected one slot;

anchor means for anchoring the leading end of said flattened loop to the juxtaposed face of said flexible loop means thereby to prevent lengthwise movement of said loop means in said slot;



said anchor means for said flattened loop comprising a U-shaped member of rigid material insertable crosswise of said belt with one leg having a snug fit in a pocket formed crosswise of the flattened end of said loop and the other leg having a snug fit in an adjacent pocket extending crosswise of said flexible loop means.

4,593,910

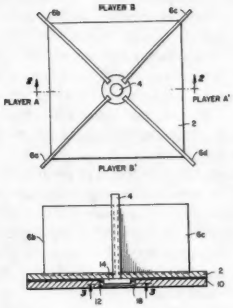
BOARD GAME

Linda T. Font, Rio Piedras, P.R., assignor to Commonwealth of Puerto Rico, P.R.

Filed Mar. 7, 1985, Ser. No. 709,130

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—273 **1 Claim**



1. A game to be played by two opposing teams of two players each, comprising

(a) a playing board,

(b) a vertical upwardly extending shaft mounted at the center of the playing board,

(c) four vertical flat opaque vanes mounted on the shaft and extending radially outwardly from it at 90° intervals, thereby defining four playing areas on the upper surface of the playing board,

(d) means for rotating the playing board and shaft through 180°,

(e) a pack of four identical play pieces each of which is adapted to be placed on one of the four playing areas and each of which is marked with items of informative material marked by holes in the play pieces,

(f) a pack of four identical information cards each of which contains in random fashion information related to the hole-marked informative material on the play pieces, and

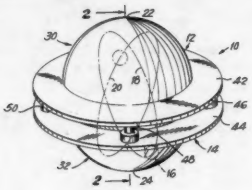
(g) a plurality of headed pins for each player, the head of each of which is marked with informative material related to that on the playing pieces and the informaticn cards, and which are adapted and intended in accordance with the rules of the game to be inserted in the holes of the playing pieces in accordance with the information on the information cards.

4,593,911

ORBITING ACTION DEVICE

Richard Cory, Bloomingburg, N.Y., assignor to Bruce R. Doyle, Newton, N.J., a part interest

Filed May 17, 1985, Ser. No. 735,259
Int. Cl.[4] A63F 7/00
U.S. Cl. 273—322 **12 Claims**



1. A manually-manipulatable action toy, comprising:

(A) a pair of generally dome-shaped hollow members, each having a closed side, an open side and a curved wall between the closed and open sides thereof, said hollow members being arranged in a mirror symmetrical relationship with the open side of one member facing the open side of the other member, each curved wall having an interior ball-guiding surface at the interior of the toy, and an exterior surface at the exterior of the toy;

(B) means for spacing the hollow members apart from each other and at a clearance between the open sides of the hollow members, said open sides freely communicating with each other and with the exterior of the toy through said clearance; and

(C) a ball movable in repetitive endless trajectories between the hollow members in response to proper manual skillful manipulation of the toy, said ball traveling in each trajectory in rolling engagement along the interior ball-guiding surface of said one member with sufficient momentum to pass through the open side of said one member and to span said clearance in a free-flying manner in one direction, and thereupon traveling in rolling engagement along the interior ball-guiding surface of said other member with sufficient momentum to pass through the open side of said other member and to span said clearance in a free-flying manner in a countercurrent direction which is opposite to said one direction,

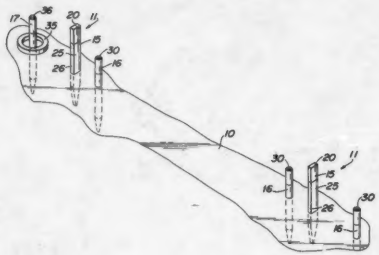
said ball being dimensioned to be smaller than said clearance and to be freely insertable therethrough into the interior of the toy, said ball also being freely escapable through said clearance to the exterior of the toy in response to improper, unskillful manipulation thereof.

4,593,912

QUOIT THROWING GAME

Andrew Rivas; Robert Rivas, both of 1031 Trenton Ave., Forked River, N.J. 08731; James Pace, 7 McCooke Pl., Bayville, N.J. 08721, and Timothy Cavanaugh, 978 Edinbergh Dr., Toms River, N.J. 08753

Filed Mar. 4, 1985, Ser. No. 707,800
Int. Cl.[4] A63B 67/06
U.S. Cl. 273—339 **6 Claims**



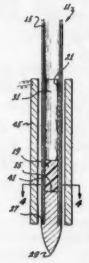
1. A quoit throwing game comprising an intermediate post having at least one flat side facing forwardly when said intermediate post is impaled in a ground surface, said intermediate post being sized and located to easily receive over its upper end a thorwn quoit, a forward post for location in front of said intermeidate post upstanding from the ground surface to an elevation less than that of said intermediate post, said forward post being sized and located to receive with some difficulty a thrown quoit directly over its upper end or rebounded from said flat side of said intemediate post, a rearward post for location in back of said intermediate post upstanding from the ground surface to an elevation less than that of said intermediate post, said rearward post being located and sized to receive with greater difficulty a thrown quoit directly over its upper end and passing over said intermediate post, and markings on said posts to indicate the length thereof impaled in the ground and determine said elevations.

4,593,913

WEIGHTED ARROWHEAD AND METHOD

Rudolph J. Kochevar, 252 Arbolada Dr., Arcadia, Calif. 91006

Continuation-in-part of Ser. No. 497,424, May 24, 1983, Pat. No. 4,502,687. This application Jun. 21, 1984, Ser. No. 622,787
Int. Cl.[4] F41B 5/02
U.S. Cl. 273—420 **18 Claims**



1. A method of weighting an arrowhead having a wall defining an interior passageway opening at a surface of the arrowhead and a pointed end for penetrating an object, said method comprising: introducing a weight composition of the desired weight, and including a sticky adhesive composition, in a solid

state into the passage with the weight composition being sticky in the solid state and heating the arrowhead and weight composition to an elevated temperature to render the weight composition flowable and to enhance the stickiness of the weight composition; and cooling the weight composition to a solid state to strongly adhere the weight composition to the wall of the interior passage to such an extent that the weight composition is not likely to release from the wall during normal use of the arrowhead.

12. A weighted arrowhead comprising:

an arrowhead having a wall defining an interior passage opening at a surface of the arrowhead and a pointed end for penetrating an object;

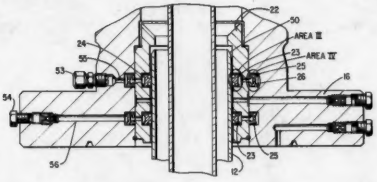
an adhesive weight composition which is sticky in the solid state and cured in situ, said weight composition being strongly adhered by the adhesive quality of the weight composition to the wall of the passage to such an extent that the weight composition is not likely to release from the wall during normal use of the arrowhead; and

the weight composition being at least somewhat pliable in the solid state.

4,593,914
WELLHEAD SEALING SYSTEM

Clarence W. Johnson, Calgary, Canada, assignor to Bralorne Resources Limited, Calgary, Canada

Filed Sep. 13, 1983, Ser. No. 531,642
Claims priority, application Canada, Jul. 19, 1983, 432780
Int. Cl.⁴ F16J *15/12, 15/32*
U.S. Cl. 277—5 **22 Claims**



1. A wellhead sealing system comprising a casing, a tubing spool around said casing, a bushing between said tubing spool and said casing, a first bushing recess, a first tubing spool recess, a first casing seal in said first bushing recess and a first bushing seal in said first tubing spool recess, said first casing seal having cylindrical inside and outside surfaces located generally at the inside and outside diameters of said seal, respectively, said cylindrical inside surface being defined by a radially inwardly extending convex central protuberance and opposed cylindrical flat surface areas extending axially outwardly from said convex central protuberance into first transition areas extending to respective end surfaces, said outside surface being defined by a circumferential centrally located groove flanked by axially outwardly extending flexible retaining flanges forming second transition areas between said cylindrical outside surface and said end surfaces.

4,593,915
ORIFICE PLATE SEAL RING

Harold C. Seger, Dixon, and Norman M. Cowan, Fremont, both of Calif., assignors to Grove Valve and Regulator Co., Oakland, Calif.

Filed Nov. 28, 1984, Ser. No. 675,653
Int. Cl.⁴ F16J *15/10;* **F16L** *55/10*
U.S. Cl. 277—12 **6 Claims**

1. In an orifice fitting comprising:

a body construction having a pair of opposing walls with aligned circular flow passages therethrough;

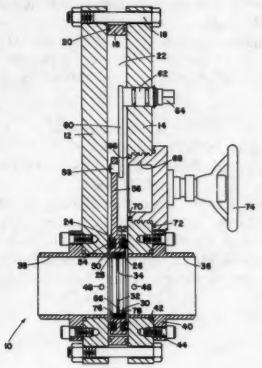
an orifice disc carrier between said walls;

said carrier having a cylindrical recess therein; and

an orifice disc received in said recess;

the improvement comprising a peripheral seal for said orifice disc including:

outer and inner seal ring components of a hard, substantially nonstretchable polymeric material;



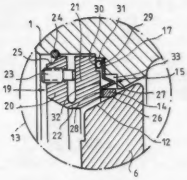
said outer seal ring component having a deep annular recess from one side thereof of a diameter to receive an orifice disc snugly;

said inner seal ring component being snugly received in said recess.

4,593,916
SEALING DEVICE PROVIDING THE UPSTREAM/DOWNSTREAM SEALING OF A VALVE

René Laulhe, Oloron Sainte Marie, and Jean-Claude Garrigues, Ogeu les Bains, both of France, assignors to Applications Mecaniques et Robinetterie Industrielle (A.M.R.I.), Bagnolet, France

Filed Jun. 27, 1985, Ser. No. 741,256
Claims priority, application France, Jun. 28, 1984, 84 10262
Int. Cl.⁴ F16J *15/12;* **F16K** *5/14, 5/00*
U.S. Cl. 277—12 **15 Claims**



1. A sealing device for the upstream/downstream sealing of a valve of the type comprising:

a tubular body comprising a bore having a shoulder with steep side,

a valving member movable inside the bore of the body and comprising at its periphery a sealing surface of a conoid shape,

a sealing packing on which comes to bear the sealing surface of the valve at the end of the valving stroke, said sealing packing comprising an annular dynamic sealing element having a low modulus of elasticity to traction along its circumference and an inner diameter substantially equal to the mean diameter of the sealing surface of the valving member and a coronal metal membrane comprising an inner edge portion sealingly connected to said annular element and an outer edge portion having a flat radial part

applied against the steep side of the bore shoulder of the body so as to provide static sealing therewith, and

a clamping device mounted inside said bore and adapted for axially clamping, in an homogeneous way, the flat part of the membrane so as to provide said static sealing, wherein said steep side forms with the clamping device an annular groove in which the annular element is radially guided and axially retained and the central part of said metal membrane is adapted so as to provide radial elasticity between said outer and inner edge portions and, consequently, radial mobility of said annular element.

4,593,917

SEAL SYSTEM, PARTICULARLY SUITABLE FOR THE BALL JOINT OF INSTALLATIONS LAID AT GREAT DEPTHS

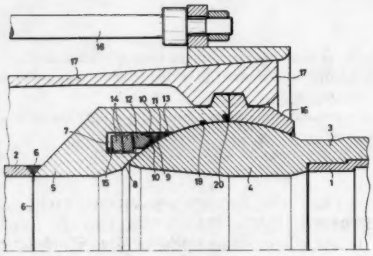
Gian P. Ferrari Aggradi, Barberino di Mugello, and Giampaolo Bonfiglioli, Inzago, both of Italy, assignors to Nuovo Pignone S.p.A., Florence and Snam S.p.A., Milan, both of, Italy

Filed Apr. 2, 1985, Ser. No. 719,068

Claims priority, application Italy, Apr. 3, 1984, 20368 A/84

Int. Cl.[4] F16J *15/24*

U.S. Cl. 277—30 **3 Claims**



1. A seal system for providing sealing between the male part and female part of a ball joint, said system comprising a metal seal ring inserted in a circumferential cavity provided in the inner surface of said femal part of the joint, characterised in that said metal seal ring is sandwiched coaxially between two wedge-shaped metal compresssion rings which are inserted into corresponding cavities provided in the front surfaces of said metal seal ring and are pressed against a metal stop ring rigid with said female part of the joint by a series of flat springs which become preloaded as a result of undergoing deflection during the forcing of the female part of the joint onto the corresponding male part.

4,593,918

SEALING ARRANGEMENT

Alfred Geissler, Alpenstrasse 22, D-8999 Weiler-Simmerberg, Fed. Rep. of Germany

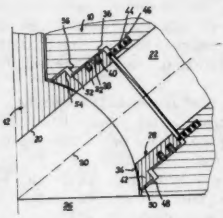
Filed Jul. 11, 1984, Ser. No. 629,710

Int. Cl.[4] F16J *15/34*

U.S. Cl. 277—96.1 **6 Claims**

1. An improvement in a sealing arrangement of a rotary valve member arranged within a combustion chamber of an internal combustion engine, the rotary valve member provided for opening and closing gas inlet and outlet channels provided in a cylinder head, the selaing arrangement comprising a substantially cylindrical sealing ring mounted for rotation and axial displacement in each one of the gas channels, an annular gap formed between a rearward surface of the sealing ring and an adjacent surface of the cylinder head, said annular gap permanently communicating with the combustion chamber and by the gas pressure therein forcing the sealing ring in its axial direction against the rotary valve member and forming a sealing contact therebetween, the improvement comprising:

the sealing ring being arranged at that side of the rotary valve member which is opposite to the combustion chamber and a connecting channel being provided outside of the outer periphery of the sealing ring and connecting said



annular gap with the combustion chamber, thereby urging the sealing ring inwardly in direction onto the combustion chamber.

4,593,919

ROTARY DRILL CHUCK WITH BELLEVILLE SPRING BIASED JAWS WHICH ARE CENTRIFUGALLY BALANCED

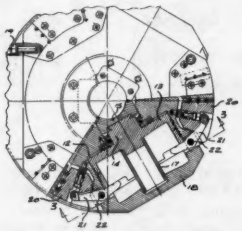
Paul W. Butler-Smith, Franlaren Farm, Mimosa Rd., Blue Hills, Transvaal, South Africa

Filed Sep. 4, 1984, Ser. No. 647,243

Claims priority, application South Africa, Sep. 6, 1983, 83/6604

Int. Cl.[4] B23B *31/14, 31/30*

U.S. Cl. 279—4 **1 Claim**



1. A rotary drilling chuck comprising:

a body,

at least three jaws movable along clamping lines in the same plane radial to a chuck axis passing through the body,

a cylinder on each said clamping line,

a hollow piston movable in each said cylinder and having an axis on a said clamping line,

a stem on each said piston carrying one of said jaws,

an end cap secured on each said cylinder,

a set of belleville springs located in the hollow of each said piston acting between each said piston and said end cap to its said cylinder,

an inlet to each said cylinder for hydraulic fluid under pressure to move said jaws to an unclamped position against the action of said belleville springs,

a mass being located between each pair of said cylinders and being circumferentially spaced therefrom, said mass being slidable along a mass axis radial to said chuck axis in the plane of said clamping lines and in a cavity in said body,

and between each said mass and each adjacent said piston a lever being pivoted to said body and directly acting on a said piston and a said mass and which is so located that centrifugal force acting on said mass causes said mass to act on pairs of said levers which, in turn, act on the pairs

of said pistons between which said mass is situated to counteract the radially outward centrifugal force acting on said pistons.

4,593,920

VEHICLE HEIGHT CONTROL SYSTEM

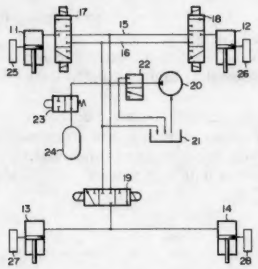
Kazuyuki Natsume, Toyohashi; Yoshihiro Sasage, Shizuoka; Naoto Ooka, Toyohashi, and Kaoru Oohashi, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 26, 1984, Ser. No. 665,065

Claims priority, application Japan, Oct. 27, 1983, 58-202435

Int. Cl.[4] B60G *17/00*

U.S. Cl. 280—6 R **5 Claims**



1. A vehicle height control system comprising:

a plurality of vehicle height adjusters operated in response to respective control signals;

position signal generator means for generating actual position signals each representing a vehicle height of a corresponding one of said vehicle height adjusters;

setting means for changing target adjustment positions of said vehicle height adjusters respectively; and

control means for generating said control signals for respective vehicle height adjusters in accordance with target differences each representing a difference between the target adjustment position and the actual position signal of the corresponding one of said adjusters, thereby enabling said vehicle height adjusters to achieve said target adjustment positions respectively,

said control means calculating differences between said target differences one from another, and when any one of said calculated differences exceeds a predetermined level, said control means temporarily stopping generation of the control signal to the vehicle height adjuster whose actual position is the closest to its target adjustment position.

4,593,921

STABILIZER SYSTEM FOR A SNOWMOBILE

Gregory J. Marier, Brooklyn Park, Minn., assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 15, 1985, Ser. No. 722,949

Int. Cl.[4] B62B *17/04*

U.S. Cl. 280—21 R **16 Claims**

1. A stabilizer system for a snowmobile vehicle, comprising:

a pair of right and left steering skis;

independent suspension means attached to the right and left of a front portion of a snowmobile frame and including shock absorbing means, said pair of steering skis being adapted to be steered to the right and left by a steering handle;

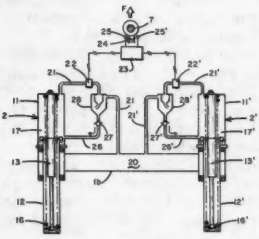
air cushion means contained in said independent suspension means, said air cushion means having expandable and contractible air chambers;

an enclosed air reservoir mounted in said snowmobile body for containing air;

air conduits for providing communications between said air chambers of said independent suspension means and said air reservoir;

normally open adjusting valves mounted in said air conduits for controlling air flow through said conduits; and

said adjusting valves being operatively coupled with the steering operation of said steering handle for throttling the air flow through the one of said adjusting valves associated with the air chamber of the independent suspension means positioned at the side of the snowmobile which is opposite to the direction in which the vehicle is being steered away from a straight-ahead direction.



4,593,922

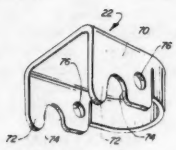
COMBINATION NESTING STOP AND STABILIZER BRACKET FOR SHOPPING CARTS

Clarence W. Upshaw, Tuttle; Russell D. Begley, Oklahoma City, and James F. Reinbold, Norman, all of Okla., assignors to UNR Industries, Inc., Chicago, Ill.

Filed Aug. 3, 1984, Ser. No. 637,490

Int. Cl.[4] B62B *11/00*

U.S. Cl. 280—33.99 A **4 Claims**



1. In a first shopping cart within which a second, similar shopping cart can be nested, each of which shopping carts comprises a tubular elevated support frame having a tubular horizontal cross member at its front end, a tubular chassis frame on which said elevated support frame is mounted, four wheels pivotally secured at the bottom of said chassis frame, and a lading-carrying basket supported on said elevated support frame, said basket comprising a multiplicity of generally parallel, thin wire elements secured to a framework formed of relatively thick wires, said chassis frame, said elevated support frame and said basket of said first shopping cart being tapered inwardly, with the bottom wall of said basket tilted upward, from back to front to permit said second cart to be telescoped within said first cart during storage, the rear wall of said lading-carrying basket of each of said shopping carts being hinged at the top to permit said wall to swing inward into the interior of said basket, said hinged rear wall having a predetermined spacing on each side of its bottom portion between said bottom portion and the respective side wall of said basket when said rear wall is disposed generally vertically, said basket framework formed of relatively thick wires of each of said first and second carts including a rear wire rim member having a horizontally disposed portion, and carrying a plurality of horizontally disposed, generally parallel, thin, bottom wire elements,

said tubular horizontal cross member at the front end of the support frame of said second cart and said thin wire elements of the bottom wall of the basket of said second cart having a gap therebetween into which said horizontally disposed portion of said relatively thick rear rim member of the wire framework of said first shopping cart can become wedged when the basket of said second cart is telescoped within the basket of said first cart during storage, a combination nesting stop and stabilizer bracket which comprises:

(a) a bracket having an inverted U-shaped cross section, the bottom end portion of each downwardly extending leg of said U-shaped member defining a downwardly opening notch to receive one end portion of said horizontally disposed portion of said relatively thick rear wire rim member of the framework of the lading-carrying basket of said first shopping cart, the distance between the outer surfaces of said downwardly extending legs being approximately equal to said predetermined spacing on each side of the bottom portion of said hinged rear wall of said first shopping cart; and

(b) means for mounting said inverted U-shaped member on said basket cart with said horizontally disposed portion of said relatively thick rear wire rim member positioned within the notches in said legs,

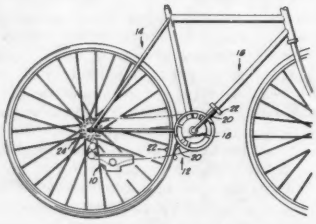
whereby (i) said downwardly extending legs of said inverted U-shaped bracket prevent said relatively thick rear wire rim member of said first shopping cart basket from being forced into said gap between said thin wire elements of the bottom wall of said lading-carrying basket and said tubular horizontal cross member at the front end of said elevated support frame of said second shopping cart when the latter is telescoped within said first shopping cart, and (ii) at the same time, said inverted U-shaped member and a similar inverted U-shaped member positioned at the other end portion of said horizontally disposed portion of said rear wire rim member of the lading-carrying basket of said first shopping cart, said inverted U-shaped members being located within the respective aforementioned predetermined spacings on each side of the bottom portion of said hinged rear wall, confine said bottom portion of said hinged rear wall from each side of said first shopping cart basket to stabilize said rear wall in its normal position midway between the side walls of the basket when said rear wall is in its generally vertical position.

4,593,923

BICYCLE SPROCKET CHAIN CLEANER

Robert Thalmann, 4905 Paseo de Las Tortugas, Torrance, Calif. 90505

Filed May 3, 1985, Ser. No. 729,926
Int. Cl.[4] B62M *9/00*
U.S. Cl. 280—261 **16 Claims**



12. Apparatus for cleaning a bicycle chain while said chain is still mounted on said bicycle wherein said chain is formed of articulated links having bottoms, sides and tops with sprocket receiving openings extending vertically through said links, said openings adapted to receive sprockets of a pedal sprocket wheel and gear wheels of said bicycle and said bicycle gearing being of such a construction that counterclockwise pedal rotation will be free wheeling and allow said chain to rotate counterclockwise, said apparatus including:

a housing having a chain entry end and a chain exit end, a pair of opposed side walls extending between said ends and a bottom surface having a first portion adjacent said entry end sloping downwardly and a second portion adjacent said exit end sloping downwardly;

a solvent reservoir formed between said first and second portions of said bottom surface of said housing;

a bottom brush adjacent said entry end mounted on said first portion and projecting upwardly to engage the bottom of said articulated links,

a pair of side brushes mounted on each of said side walls in spaced opposed relationship to engage the side of said articulated links;

a top brush mounted to overlie and contact the top of said articulated links;

said bottom and side brushes extending into said reservoir to drawup solvent to said articulated links for cleaning the same;

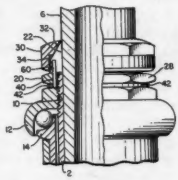
a cover to fit on said housing, said cover including chain engaging means to depress said articulated links thereunder and maintain a portion of the chain within said housing in contact with said brushes.

4,593,924

HEADSET FOR BICYCLES

Maximino R. Cabeza, Nevada St. 306, Ric Piedras, P.R. 00926

Filed Jul. 15, 1983, Ser. No. 514,018
The portion of the term of this patent subsequent to Jul. 27, 1999, has been disclaimed.
Int. Cl.[4] B62K *21/18*
U.S. Cl. 280—279 **4 Claims**



1. A headset for a bicycle, comprising

(a) the upwardly extending hollow cylindrical stem of the steering fork of the front wheels of a bicycle,

(b) the downwardly extending cylindrical handlebar stem positioned within the fork stem telescopically,

(c) a contractile clamping ring surrounding and connected by threads to the upper end of the fork stem and having at its upper part an un-threaded internal surface surrounding the adjacent part of the handlebar stem and a frusto-conical external surface,

(d) a locknut loosely surrounding the handlebar stem and connected by threads to the clamping ring, and having a frusto-conical internal surface engaging the frusto-conical external surface of the clamping ring whereby screw threaded movement of the nut toward the ring contracts the ring to cause engagement of the un-threaded internal surface of the clamping ring with the handlebar stem, and

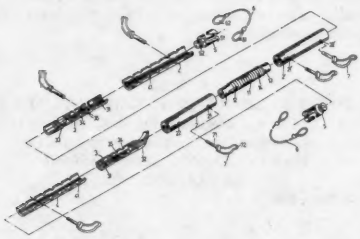
(e) means for releasably connecting the clamping ring to the fork stem to prevent loosening of the connection between these parts.

4,593,925

SAFETY HAULING COUPLER

Ching H. Laie, No. 3, Ming-li Street, West District, Taichung City, Taiwan

Filed Sep. 27, 1984, Ser. No. 655,067
Int. Cl.[4] B60D *1/14*
U.S. Cl. 280—493 1 Claim



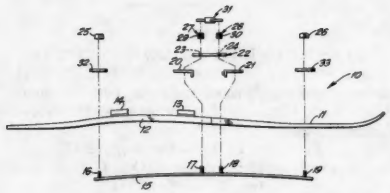
1. A safety hauling coupler, comprising a buffer tube with a spring fitted thereover and two pin holes at one end and a slot at the other, two extension tubes having pinholes at both ends and fitted over and fixed to the buffer tube by means of retaining pins, two connecting tubes fitted in the extension tubes and having two pinholes and a hexagon socket screwed to one of them and a chisel-headed taper block fixed to the other, two hooked heads each consisting of a hook for holding loops at each end of a wire cable and a screw for screwing in female-threaded ends of the connecting tubes, two sleeves having a plurality of pinholes and adjustably fixed to the connecting tubes and the wire cables, and six retaining pins for fixing purposes so that after the wire cables are attached to supports on a hauling vehicle and a hauled vehicle and fitted in the sleeves, the safety hauling coupler joins the two vehicles and is adapted to absorb the kinetic energy of shock load and prevent the hauling vehicle from being hit by the hauled vehicle.

4,593,926

SKI WHICH MAY BE DISASSEMBLED OR FOLDED

Nicola F. Pergola, 87 - 89th St., Brooklyn, N.Y. 11209

Filed Aug. 13, 1984, Ser. No. 639,728
Int. Cl.[4] A63C *5/02*
U.S. Cl. 280—603 16 Claims



1. A ski which may be assembled by the user from a plurality of pieces and which, when disassembled, is compact and readily portable, the ski comprising:

a first ski piece having a top surface, a bottom surface and a first end plate;

a second ski piece having a top surface, a bottom surface and a second end plate adapted to be fitted against said first end plate when the ski is assembled;

a joining plate connected to said first and second ski pieces at their bottom surfaces and providing therewith a flush and smooth surface;

a first post which protrudes from the top surface of said first ski piece and is fixed to the bottom joining plate, a second post which protrudes from the top surface of said second ski piece and is fixed to the same bottom joining plate;

a nut means which is removably screwed onto said posts to secure said joining plate to said ski; and

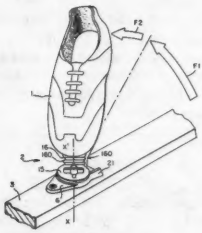
tensioning means applied to said nut means to insure intimate mating of the first and second ski pieces under tension and which, to disassemble the ski pieces, is disjoined from the nut means.

4,593,927

PIVOTABLE CROSS-COUNTRY SKI BINDING

George P. J. Salomon, and Jean Hue, both of Annecy, France, assignors to Salomon S.A., Annecy, France

Continuation of Ser. No. 335,523, Dec. 29, 1981, Pat. No. 4,498,687. This application Oct. 5, 1984, Ser. No. 658,313
Claims priority, application France, Jan. 6, 1981, 81 00358
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.[4] A63C *9/10*
U.S. Cl. 280—615 31 Claims



1. A ski binding comprising:

means for securing the front of a ski shoe to a ski;

means for preventing substantially free torsional movement of said shoe around a substantially vertical axis of said binding; and

means for permitting the heel of said shoe to be lifted vertically while allowing for substantially free torsional movement of said shoe around a substantially vertical axis of said binding as a function of the height of said shoe with respect to the top surface of said ski.

4,593,928

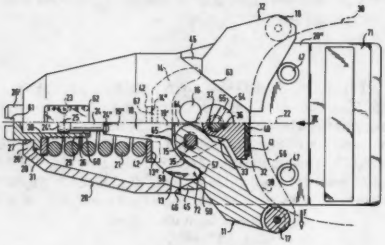
SAFETY TOE UNIT FOR A SKI BINDING

Georg Scheck, Leonberg, and Martin Bogner, Ostfildern, both of Fed. Rep. of Germany, assignors to Geze GmbH, Leonberg, Fed. Rep. of Germany

Filed Oct. 10, 1984, Ser. No. 659,437
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337993
Int. Cl.[4] A63C *9/08*
U.S. Cl. 280—625 13 Claims

1. A safety toe unit for a ski binding comprising two sole retaining jaws each having a ski boot retaining point, a pivot axis about which each jaw can pivot laterally outwards, said jaws pivoting in opposite directions, a pressure member having a pair of projections which respectively act on a respective sole retaining jaw at the front between the pivot axis and the ski boot retaining point thereof, said pressure member being displaceably arranged in the longitudinal direction of the ski substantially in front of the sole retaining jaws, a compression spring, and a housing which is securable to the ski and against which said compression spring is braced, said pressure member being urged rearwards by said compression spring, characterized in that said pivot axes are laterally spaced from a vertical and central longitudinal plane (22) of said unit on opposite sides thereof and are slightly tilted inwards towards said plane (22), said pressure member (19) has a forwardly directed exten-

sion (19'', 24'', 24) within the compression spring (21), and an elongated guide sleeve (26) is secured to the housing (20), the front end region (24) of the extension (19'', 24'', 24) being ball-shaped (24') and slidably seated in said sleeve, said extension being mounted in the end region of the unit remote from the sole retaining jaws (11,12) for displacement in the longitudinal direction of the ski and being mounted on the housing for small tilting movements about a transverse tilting axis (23), and the front end region of the extension being also mounted on the housing (20) for small tilting movements about a vertical tilting axis (25), the two tilting axes (23,25) intersecting in the central longitudinal plane (22).



4,593,929

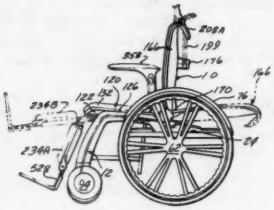
WHEELCHAIR

Ronald H. Williams, 13564 Trinity, Detroit, Mich. 48223

Filed Jan. 12, 1983, Ser. No. 457,328

Int. Cl.[4] B62B *11/00*

U.S. Cl. 280—650 **35 Claims**



1. A transport vehicle for transporting an occupant, said transport vehicle comprising:

a pair of spaced apart side frame assemblies disposed in a spaced apart parallel relationship, each of said pair of side frame assemblies having a front wheel mounting means and a rear wheel mounting means, said rear wheel mounting means comprising:

a wheel mounting member movably interconnected with a respective side frame assembly of said pair of side frame assemblies; and

wheel adjustment means operably disposed between said wheel mounting member and said respective side frame assembly, said wheel adjustment means selectively operable to move said wheel mounting member horizontally relative to said respective side frame assembly;

a pair of caster wheels, each of said pair of caster wheels connected with one of said front wheel mounting means;

a pair of drive wheels, each of said drive wheels having a hub member, a wheel member, a means for slidably connecting said wheel member to said hub member, said hub member fixedly secured to said wheel mounting member of said wheel mounting means of said pair of side frame assemblies, said means for slidably connecting said wheel member interposed said wheel member and said hub member such that said wheel member may rotate relative to said hub member;

a seat base assembly interposed each of said pair of said side frame assemblies;

fastening means for interconnecting said seat base assembly with said pair of side frame assemblies; and

a seat back assembly having an upper end and a lower end, said seat back assembly being interconnected at said lower end of said seat back assembly to each of said pair of side frame assemblies.

4,593,930

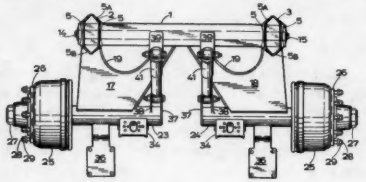
RUNNING GEAR FOR A TRAILER VEHICLE

Robert C. B. Davis, Caverswall, England, assignor to Rubery Owen-Rockwell Limited, Wednesbury, England

Filed Oct. 12, 1984, Ser. No. 659,901

Int. Cl.[4] B60G *3/02*

U.S. Cl. 280—690 **12 Claims**



1. A running gear for, a trailer vehicle comprising an elongate beam, upwardly directed and aligned first brackets rigid with said beam adjacent each end thereof and being adapted for transverse attachment of said beam to a trailer vehicle, aligned second brackets depending from said beam adjacent each end thereof, third bracket means depending from said beam intermediate and aligned with said second brackets, first and second arms each having a front end and a rear end and each being pivotally carried at said front end by one of said second brackets and by said third bracket, a stub axle carried by and extending transversely outwards from said rear end of each said arm, each said arm and said respective stub axle thereby forming an assembly, brake means and wheel mounting means on each said stub axle, and a member rigid with and extending rearwardly from each said assembly and having a platform adapted to mount an air spring thereon.

4,593,931

VEHICLE HEIGHT ADJUSTMENT SYSTEM PROVIDING UNIFORM HEIGHT CONTROL

Harunori Shiratori; Masaru Ishikawa, both of Toyota, and Hisami Kato, Tokyo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 12, 1984, Ser. No. 660,125

Claims priority, application Japan, Oct. 17, 1983, 58-193773

Int. Cl.[4] B60G *17/00*

U.S. Cl. 280—714 **14 Claims**

1. A height adjustment system for a vehicle with wheels and a body, said height adjustment system comprising:

(a) a source of pressurized working fluid;

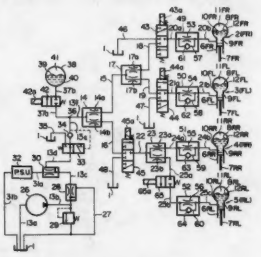
(b) a plurality of fluid pressure actuated wheel suspension units, each of which resiliently pushes a one of said wheels of said vehicle downwards with respect to said body thereof, according to the amount of pressurized working fluid supplied to said wheel suspension unit;

(c) a passage means for conducting supply of working fluid from said source thereof to said wheel suspension units;

(d) a plurality of valve means, provided at intermediate points of said passage means, for controlling flow of working fluid therethrough; and

(e) a flow divider means comprising an inlet and two outlets,

one of said outlets being communicated to a first set of said wheel suspension units for a first set of said wheels of said vehicle and the other of said outlets being communicated to a second disjoint set of said wheel suspension units for a second disjoint set of said wheels of said vehicle, incorporated at an intermediate point of said passage means, for providing a branch point of said passage means; for receiving supply of pressurized working fluid at its said inlet; for dividing said supply between its two said outlets in a ratio which is substantially independent of the pressure at said two outlets; and for being controlled with regard to said ratio substantially independent of the pressures at said two outlets thereof in which it divides said working fluid supply to it between its two said outlets.



4,593,932

OUTRIGGER DEVICE FOR WHEEL-MOUNTED WORKING MACHINES

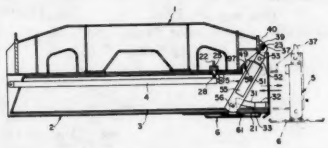
Hiroshi Miyazawa, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 18, 1982, Ser. No. 409,145

Claims priority, application Japan, Aug. 18, 1981, 56-130016; Oct. 9, 1981, 56-161119; Feb. 22, 1982, 57-27924; Jun. 10, 1982, 57-100108

Int. Cl.[4] B60S *9/12*

U.S. Cl. 280—765.1 **15 Claims**



1. An outrigger device for wheel-mounted working machines having a traveling body, comprising:

a fixed box fixed to said wheel-mounted traveling body;

an extensible beam storably fitted in said fixed box;

a jack cylinder having a longitudinal axis and a float at a lower end portion thereof and;

pivot means establishing a horizontal pivot axis passing through the upper portion of a front end of said extensible beam, through an upper portion of said jack cylinder, and intersecting said longitudinal axis of said jack cylinder, said jack cylinder being swingable around said axis of said pivot means between a vertical position and an inclined stored position where it is drawn inwardly of the extensible beam, where it inclines inwardly and downwardly from said pivot means toward said traveling body and where said float is stored beneath said extensible beam.

4,593,933

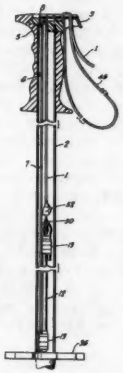
SKI POLE WRIST STRAP AND SEAT ASSEMBLY

Louis E. Nunno, Villa Lots Rd., Paso Robles, Calif. 93446

Continuation-in-part of Ser. No. 474,439, Mar. 11, 1983, abandoned. This application Jan. 23, 1984, Ser. No. 573,052

Int. Cl.[4] A63C *11/00*

U.S. Cl. 280—812 **12 Claims**



1. A portable ski-pole wrist strap assembly comprising a pair of hollow ski poles and ski pole handles wherein each of said ski pole handles has a hollow center section and a break-away insert wherein the break-away insert is fitted within a recess in the top of the handle, said recess having a locking rim which extends inward around the perimeter of the recess and extending over the outer edge of the break-away insert, said insert having a semi-cylindrical section extending downward which is aligned with the hollow center section and containing a slot through the body of the insert, said slot not being aligned with the hollow center section of the ski pole handle, said handle being inserted over the end of a ski pole such that said semi-cylindrical section fits within the hollow center of the ski pole which is inserted within the hollow center section of the ski pole handle.

4,593,934

NEWSPAPER HOLDER

Andrew S. Lehman, 960 Bellmore Ave., North Bellmore, N.Y. 11710

Filed Nov. 5, 1984, Ser. No. 668,330

Int. Cl.[4] B42D *17/00, 3/04*

U.S. Cl. 281—45 **3 Claims**

1. An article of manufacture for use in holding a folded newspaper along its fold line to obviate the transfer of newsprint to the holder's hand while said paper is being read, said holder comprising a body consisting of four cardboard strips in an operative arrangement in which said strips are in close

adjacent relation to each other with a relatively small central clearance space and two similarly relatively small adjacent auxiliary clearance spaces being bounded in said operative arrangement by the adjacent edges of said four strips, said strips having a width variation in which the two inner strips are each approximately one half the width of the two outer strips and do not exceed three quarters of an inch, and two heat fusable plastic plies disposed on opposite sides of said four cardboard strips and heat sealed to each other about their respective peripheries to confine said four cardboard strips therebetween and additionally sealed along three lines to each along said relatively small central and said auxiliary clearance spaces, such that when said holder is in a closed condition about said newspaper along said three heat seals said holder provides a newsprint-free grip therewith by assuming a U-shaped configuration about said newspaper which is the sum of closing movement of said inner strips about said central seal and of closing movement of each inner strip with its adjacent outer strip about each said auxiliary seal, said four cardboard strips being of a height relative to said width of said three relatively small seals to cause engagement of the adjacent edges of said strips with each other during the assumption of said U-shaped configuration, whereby as a result of said engagement there is exerted a slight bias in said U-shaped configuration to partake of opening movement which facilitates release of the individual pages of the newspaper as required for reading.

4,593,935

CONDITIONALLY SELF-COPYING STATIONERY

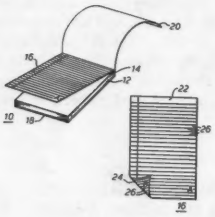
Peter J. M. Kearns, Cardiff, Wales, assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 28, 1984, Ser. No. 644,901

Claims priority, application United Kingdom, Sep. 16, 1983, 8324849

Int. Cl.[4] B41L *1/16, 1/20;* **B41M** *5/00*

U.S. Cl. 282—28 R **7 Claims**



1. A pad of stationery for hand-written information, said pad including a plurality of stacked writing sheets each having a top surface and a bottom surface, said pad comprising a selectably-insertable copy sheet haveing first and second faces, said top surface of said each of said plurality of writing sheets comprising a carbon front coating, said bottom surface of said each of said plurality of writing sheets comprising neither a carbon front coating nor a carbon back coating, said second face of said copy sheet comprising neither a carbon front coating nor a carbon back coating, and said first face of said copy sheet comprising a carbon back coating, such that, with said copy sheet inserted with said first face uppermost between an upper one of an adjacent pair of said plurality of writing sheets and a lower one of said adjacent pair of said plurality of writing sheets, no record is producible on said lower one of said adjacent pair of said plurality of writing sheets in consequence of writing pressure upon said upper one of said adjacent pair of said plurality of writing sheets, and such that, with said copy sheet inserted between said lower and upper ones of said adjacent pair of writing sheets with said second face uppermost, a record is producible upon said lower one of said adjacent pair of writing sheets in consequence of writing pressure upon said upper one of said adjacent pair of writing sheets, said copy sheet including writing guidelines, visible through the upper ones of said adjacent pair of writing sheets, upon said first face and upon said second face thereof.

4,593,936

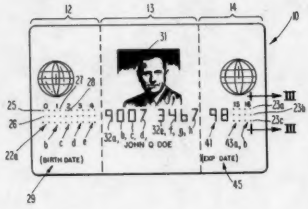
UNIVERSAL CREDIT CARD

George E. Opel, 4031 Kottle Dr., Lafayette Hill, Pa. 19444

Filed Mar. 6, 1984, Ser. No. 586,857

Int. Cl.[4] B42D *15/00*

U.S. Cl. 283—112 **6 Claims**



1. A credit card comprising:

a rectangular card of predetermined dimensions having a front side and a back side;

a photographic image adheringly attached to said front side;

identification indicia embossed on said front side so as to be reproduced on an imprinted charge slip consisting of:

a. a pre-selected number; and

b. a plurality of spaced apart dot arrays adjacent said pre-selected number, wherein the spacing of said dots is predetermined so as to define, when a charge slip is imprinted, a plurality of spaced apart dot array patterns on the slip, each such pattern being suitable for entry of a character.

4,593,937

DEVICE FOR CONNECTING AND DISCONNECTING A TUBULAR PIPE MOVABLE INSIDE A FIXED TUBULAR PIPE

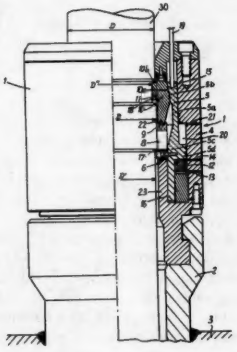
Jean C. Schawann, Idron; Jean P. Caumont, Pau, and Jean Falcimaigne, Bois Colombes, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

Filed Sep. 14, 1984, Ser. No. 651,218

Claims priority, application France, Sep. 15, 1983, 83 14664

Int. Cl.[4] F16L *37/16*

U.S. Cl. 285—18 **10 Claims**



1. A device for connecting and disconnecting a first tubular conduit movable in longitudinal translation inside a second

fixed tubular conduit of the type comprising a mobile piece in the form of a longitudinally sliding sleeve and which, for locking, by bearing with an inclined bearing surface of at least one mobile detent, causes said detent to swing through an opening formed in a wall of this second tubular conduit into a groove formed in said mobile tubular conduit, wherein the drive means for causing longitudinal sliding of said sleeve comprise at least one radial finger projecting through an aperture formed in said wall of said fixed tubular conduit and sliding in a housing formed in the thickness of said wall of the fixed conduit, during locking, under the effect of the thrust exerted by the downward movement of said first mobile tubular conduit onto said finger by means of a shoulder due to the change of diameter and with which said mobile conduit is provided and, during unlocking, by sliding in the opposite direction under the effect of hydraulic or mechanical means.

4,593,938

WELDING RING

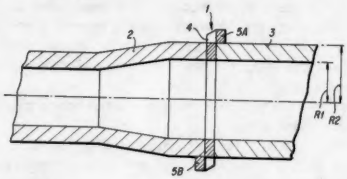
René Denise, Malesherbe, and Francis Moreau, Lisses, both of France, assignors to Societe d'Etude et de Construction de Meteurs d'Aviation S.N.E.C.M.A., Paris, France

Filed Oct. 12, 1984, Ser. No. 660,214

Claims priority, application France, Oct. 12, 1983, 83 16175

Int. Cl.⁴ F16L *13/02*

U.S. Cl. 285—22 **4 Claims**



1. A welding ring of welded deposition material, comprising:

a disc-like body having two two axial faces and a radially outer portion integral therewith; and

a plurality of axially extending reliefs formed only on said radially outer portion, said reliefs each comprising a portion of said disc-like body deformed axially out of the plane of said disc-like body to form localized protrusions, said localized protrusions being continuous and having circumferential ends smoothly merging with said disc-like body, said localized protrusions being formed on both axial faces of said disc-like body, whereby said welding ring may be positioned between substantially abutting members with said protrusions ensuring a precise coaxial relationship of said ring and abutting members by engaging an outer surface of said abutting members.

4,593,939

ARRANGEMENT FOR INTERCONNECTING CONDUITS

Klaus Blaseck, Burgdorf, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,191

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1982, 3226270

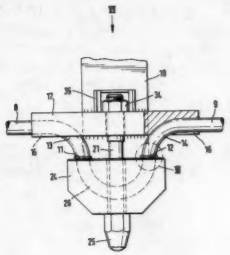
Int. Cl.⁴ F16L *39/00*

U.S. Cl. 285—137.1 **10 Claims**

1. In a hot cell of a nuclear facility for reprocessing irradiated nuclear fuels, the hot cell containing at least two exchangeable racks for accommodating process equipment, the racks being mutually adjacent and positioned against a wall of the hot cell, an arrangement for interconnecting a first plurality of conduits extending outwardly from one of the racks with a second plurality of conduits extending outwardly from the other one of the racks, the arrangement comprising:

a supporting bracket fixedly connected to the wall of the hot cell and having receiving means for receiving the respective conduit end portions of said first plurality of conduits and the respective conduit end portions of said second plurality of conduits;

the first and second pluralities of conduit end portions being bent away from the support bracket ninety degrees so as to cause the open terminations of the first plurality of conduits to be adjacent to and spaced from corresponding ones of the open terminations of the second plurality of



conduits and so as to cause the conduit axes of said conduits at said open terminations to be parallel to each other;

a block having a plurality of mutually parallel U-shaped conduit segments contained therein, the open terminations of each of said conduit segments being spaced apart so as to cause said conduit segments to connect respective ones of said first plurality of conduit end portions with corresponding ones of said second plurality of conduit end portions when said block is placed in a predetermined position with respect to said fixed supporting bracket; and,

threaded fastener means for tightly holding said block to said supporting bracket in said predetermined position.

4,593,940

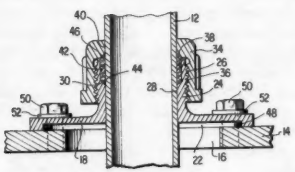
FLANGE ASSEMBLY FOR HYDRAULIC POWER SYSTEMS

Don R. Wilder, 1367 W. Ninth St., Upland, Calif. 91786

Filed Apr. 29, 1983, Ser. No. 489,780

Int. Cl.⁴ F16L *5/00*

U.S. Cl. 285—158 **3 Claims**



1. A flange assembly adapted for connecting a hydraulic fluid supply or return pipe to a reservoir having a wall portion and an access opening therethrough comprising:

a unitary flange member having a cylindrical portion with a through bore, said cylindrical portion being externally threaded and having an internal annular recess extending from one end thereof and a flange integral with and extending outwardly from the other end of said cylindrical portion, the face of said flange opposite said cylindrical portion having a shallow annular recess extending radially from said through bore and of greater diameter than that

of said access opening, said flange having bolt holes radially outwardly of said recess;

a cap member having a through bore and being internally threaded to mate with said cylindrical portion;

a compressible sleeve receiveable in said internal annular recess of said cylindrical portion and engageable by said member; and

an O-ring receiveable in said shallow annular recess of said flange.

4,593,941

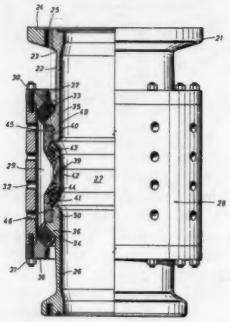
DIVERTER FLEX JOINT

Gary L. Whightsil, Sr., Arlington, Tex., assignor to LTV Energy Products Company, Houston, Tex.

Filed Mar. 15, 1984, Ser. No. 571,304

Int. Cl.[4] F16L *27/12*

U.S. Cl. 285—165 **22 Claims**



1. A riser assembly for conducting fluids comprising:

(a) a plurality of riser elements being connected by connecting means;

(b) at least one pair of said riser elements being connected by a flexible connector;

(c) said riser elements each adjacent to a generally cylindrical housing, each having at one end a flange for connecting to said connecting means, and at the other end a shoulder means for engaging with said flexible connector, and a first interface element;

(d) said flexible connector including said housing having an internal diameter that is greater than the external diameter of said riser elements, a retainer means at each end of said housing adapted for retaining said adjacent riser elements in a fixed position relative to said housing, a first pair of flexible elements disposed between said shoulder means and said retainer means, a sealing assembly disposed between said first interface elements of said pair of riser elements, said sealingly assembly including an intermediate element, a pair of second interface elements and a second pair of flexible elements disposed between and sealingly engaged with said intermediate element and said second interface elements, and said interface elements being adapted for engaging a sliding seal means disposed between said first interface elements and said second pair of interface elements,

whereby relatively small tension forces are transmitted through said shoulder means to said first flexible elements as compression forces, relatively large tension forces are, in addition, transmitted through said first interface elements to said sliding seal means as tension forces, and compression forces are directly transmitted through said first and said second interface elements to said second flexible elements.

4,593,942

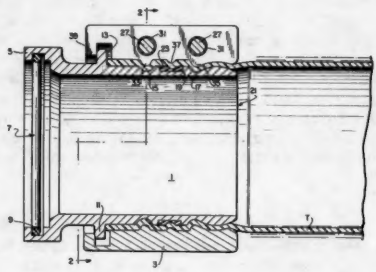
COUPLING FOR THIN-WALLED FLEXIBLE HOSE

Ernest B. Loker, Edgewater, Md., assignor to Hydrasearch Co., Inc., Annapolis, Md.

Filed Jul. 16, 1984, Ser. No. 631,055

Int. Cl.[4] F16L *33/18*

U.S. Cl. 285—253 **8 Claims**



1. A coupling for use with flexible hose, tubing and the like comprising:

(a) a first member,

(b) a second member surrounding said first member,

(c) said members each having a tubing receiving end,

(d) means for receiving and retaining tubing positioned between said members, said receiving and retaining means comprising:

(1.) at least one first substantially annular tubing groove on one of said members,

(2.) a substantially annular seal receiving groove on one of said members between said tubing receiving end and said one tubing groove,

(3.) a first substantially annular, rounded ridge cooperating with the tubing and said tubing groove for forcing the tubing into said tubing groove without cutting or biting into the tubing,

(4.) sealing means having a greater width than thickness and a width smaller than said sealing groove and about the same thickness as said sealing groove in said seal receiving groove,

(5.) a second substantially annular means in the form of a substantially annular rounded ridge element on the other of said members cooperating with said tubing and said sealing means for exerting a force into said sealing means without cutting or biting into the tubing.

4,593,943

TUBING JOINT

Tomio Hama, and Kiyoyasu Yamazaki, both of Okaya, Japan, assignors to Kabushiki Kaisha Nihon Pisco, Okaya, Japan

Filed Jul. 6, 1984, Ser. No. 628,400

Claims priority, application Japan, Aug. 28, 1983, 58-153701; Aug. 28, 1983, 58-153702; Aug. 30, 1984, 59-88174

Int. Cl.[4] F16L *37/00*

U.S. Cl. 285—308 **4 Claims**

1. In a tubing joint assembly capable of releasably coupling with a flexible tubing inserted in a tube-receiving end thereof, said assembly comprising a tubing joint containing, a release ring, a guide ring with a groove therein, a grip ring, and an elastic sleeve having a recess, the improvement wherein:

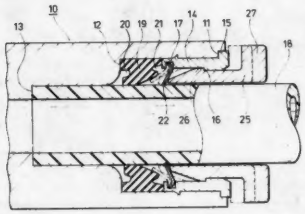
(a) the grip ring is formed of a plurality of inner and outer radial notches cut alternately from its inner and outer circumferences with the outer portion thereof being uniformly bent in a tube-admitting direction to form an obtuse angle in cross-section;

(i) the bent outer portion thereof is inserted in the guide

ring groove with the outer notches pointed away from the tube-receiving portion;

(ii) the inner notches are pointed away from the tube-receiving portion to grip the surface of the tubing such that longitudinal movement of the release ring towards the inner notches will disengage the inner notches from the tubing and move them into the recess in the elastic sleeve;

(b) the release ring has a substantially uniform inner diameter which approximates the outer diameter of the flexible tubing to be coupled, and outer diameter portions which comprise, in sequence:



(i) a relatively large outer diameter portion extending beyond the tubing joint to provide a gripping means for axially sliding said release ring;

(ii) a relatively small outer diameter portion extending inwardly from said relatively large outer diameter portion into said tubing joint for receiving a portion of a guide ring; and

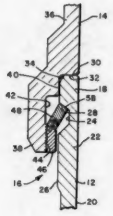
(iii) an intermediate outer diameter portion which tapers to a wedge at the inner end of said release ring for axially pressing against a grip ring to release it from engagement with a flexible tubing and move it against an elastic sleeve.

4,593,944

PILE DRIVING CONNECTOR

Lionel J. Milberger, Houston, Tex., assignor to Vetco Offshore, Inc., Ventura, Calif.

Filed Jan. 23, 1984, Ser. No. 573,197
Int. Cl.[4] F16L *37/10*
U.S. Cl. 285—321 **17 Claims**



1. A pile driving connector comprising:

a tubular pin member for telescopic connection with a cooperating box member, said pin member having an inner diameter and defining an axis, said pin member having a wall with an annular locking groove in the outer face thereof, said locking groove having a bottom which is generally parallel to said axis and a first flat side surface extending outwardly therefrom at an angle of greater than 90° whereby said groove is narrower at said bottom than at said outer face, said groove being configured for operational engagement with locking ring means, said pin member further having a generally flat annular bearing surface at an end thereof for driving engagement with a bearing shoulder of a cooperating box member;

a tubular box member, said box member having an inner diameter which is substantially equal to said pin member inner diameter and an axis and including:

a bore communicating with said inner diameter at a first end of said box member and comprising a box member section of increased inner diameter for coaxially receiving said pin member;

a counterbore configured to be at least in part adjacent to and facing said locking groove of said pin member upon seating of said pin member in said box member, said counterbore comprising a portion of said bore extending from said box member first end and having an enlarged diameter; and

a bearing shoulder defining the end of said bore, said bearing shoulder being configured for driving engagement with said bearing surface of said pin member, contact between said bearing shoulder and said pin member bearing surface defining the seated position of said pin member in said box member;

locking ring means mounted within said counterbore of said box member coaxially with said pin member and box member, said locking ring means having a base portion and a segmented upper coupling portion, said segmented upper portion being defined by a plurality of slots extending longitudinally toward said base portion, said slots being disposed about said locking ring means so as to form a plurality of spaced-apart stud elements, said stud elements extending from said base portion and having generally flat end surfaces for engagement wtih said first said side surface of said locking groove, said stud elements each having a longitudinal axis, and said end surfaces thereof being inclined at an angle relative to a plane transverse to their respective axes said locking ring means establishing a tapered interlocking connection between said pin and box members and providing a force which urges said bearing surface of said pin member against said bearing shoulder of said box member; and

means for detachably affixing said locking ring means base portion to said box member within said counterbore at a location radially and axially displaced with respect to said pin member locking groove first surface, said affixing means mounting said locking ring means such that said stud element end surfaces are in contact with said pin member locking groove first side surface, and said stud element axes are oriented generally transversely with respect to said locking groove first side surface when said locking ring means is in an unstressed condition whereby said stud element end surfaces are angularly oriented relative to said locking groove first side surface when in said unstressed condition.

4,593,945

OVEN LATCH ASSEMBLY

William J. Arute, Plainville; Thomas W. Spargo, Terryville, and Edward C. Ambler, Newington, all of Conn., assignors to The Stanley Works, New Britian, Conn.

Filed Mar. 14, 1984, Ser. No. 589,596
Int. Cl.[4] E05C *3/06*
U.S. Cl. 292—201 **25 Claims**

1. An automatic safety latch for use in combination with an oven door in a self-cleaning kitchen range having a striker on the door to be engaged therewith, said latch comprising:

a. a base plate;

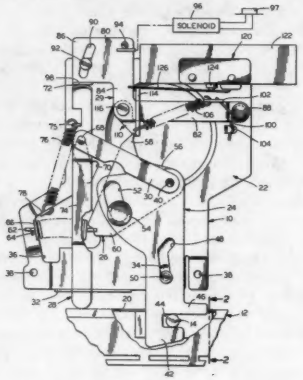
b. a latch bolt projecting beyond said base plate and having a slot extending inwardly from one side margin of said projecting portion adapted to receive and engage the associated striker;

c. means mounting said latch bolt on said base plate for initial rotational movement from an unlatched position to an intermediate position in which the associated striker is aligned in said slot and for subsequent generally rectilinear

movement to a latched position to fully seat the associated striker within said slot;

d. biasing means biasing said latch bolt into each of said unlatched, intermediate and latched positions and permitting said rotational and rectilinear movement of said latch bolt, said biasing means including a latch member, means pivotably mounting said latch member to said latch bolt and for movement between a first position and a second position in which said bolt is latched, and spring means biasing said latch member and thereby said latch bolt into each of said unlatched, intermediate and latched positions thereof;

e. door sensing means operable upon closing of the associated door to permit movement of the latch bolt into the latched position;



f. locking means movable on said base plate from a first position to a second position operatively engageable with said biasing means in the latched position of said latch bolt to prevent movement of said biasing means and thereby said latch bolt from the latched position to the unlatched position, said locking means being movable from a first position to a second position and being engageable with said latch member to prevent its movement from its second position to its first position and thereby to lock the latch bolt in its latched position; and

g. actuating means for moving said locking means to said second position and operable upon movement of the associated oven door to the fully closed position.

4,593,946

DOOR BRACKET FOR USE IN VEHICLE BODYWORK

John W. Rich, Rte. 1, Box 228, Elburn, Ill. 60119

Continuation of Ser. No. 100,337, Dec. 5, 1979, abandoned. This application Jul. 15, 1983, Ser. No. 513,787

Int. Cl.[4] E05C *19/18*

U.S. Cl. 292—288 **5 Claims**

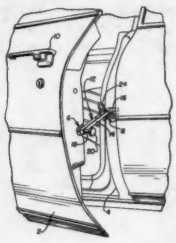
1. For use with a vehicle having a body and a door pivotal around a substantially vertical axis and movable between an open and a closed position with respect to the body, either said door or said body having a latch mechanism and the other of said door or said body having a lock element, wherein the latch mechanism releasably lockingly engages the lock element on the other side of said door or said body when said door is in its closed position, a device for holding the door in a predetermined open position comprising:

an elongated member;

first means secured to one end of the elongated member for releasably lockingly engaging the latch mechanism;

second means secured to the other end of the elongated member for releasably lockingly engaging the lock element; and

wherein the lock element comprises a cylindrical striker pin and wherein said first means comprises a cylindrical pin substantially identical to said lock element wherein said second means comprises a pair of elongated tabs extending laterally outwardly from at least one side of said elongated



member, said tabs being spaced apart by an amount sufficient to receive the striker pin therebetween; and

wherein with said first means attached to said latch mechanism, said elongated member extends substantially horizontally so that the weight of the device maintains the locking engagement between said second means and the lock element.

4,593,947

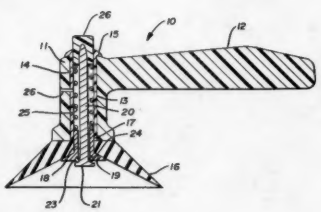
VACUUM LIFTING DEVICE

Roderick E. Yocum, 11615 Detwiler Rd., Columbiana, Ohio 44408

Filed Aug. 30, 1984, Ser. No. 645,679

Int. Cl.[4] B66C *1/02*

U.S. Cl. 294—64.1 **4 Claims**

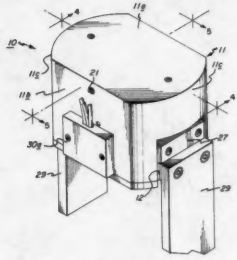


1. An improvement for a vacuum lifting device comprising a main body member with a handle attached thereto, a deformable elastomeric apertured suction cup on said body member, the improvement comprising a sleeve within said body member, means for securing said sleeve therein, a retainer sleeve having a tapered annular flange extending outwardly from said apertured suction cup and engaging the same, said retainer sleeve engaged partly within said sleeve, a valve stem within said sleeve having a gasket retainer flange on said valve stem and an O-ring on said gasket retainer flange in sealing relation with said retainer sleeve, resilient valve stem engagement means, and means to vent said suction cup via said sealing means.

4,593,948
GRIPPER ASSEMBLY

Nicky Borcea, 95 Steep Hill, Weston, Conn. 06883, and Alexandru D. Ionescu, 190 Sport Hill Rd., Easton, Conn. 06612

Filed Aug. 23, 1984, Ser. No. 643,559
Int. Cl.[4] B66L *3/16;* F15B *13/42*
U.S. Cl. 294—88 7 Claims



1. A gripper device comprising,

means defining a housing having a piston chamber formed therein,

a piston reciprocally mounted in said piston chamber, means for normally biasing said piston toward an inoperative position,

a pair of laterally displaceable slide means mounted in said housing means, said slide means being rectilinearly displaceable,

a finger means connected to said of said slide means,

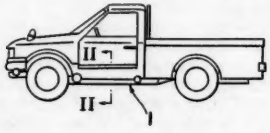
a cam actuator means including a cam connected to said piston,

and said slide means having opposed cam surfaces, and said cam actuator means including cam rollers disposed between said cam and said opposed cam surfaces, said cam rollers being disposed in a camming relationship with said cam whereby said slide means and connected fingers are laterally displaced to move said finger means in parallelism between an operative and inoperative position.

4,593,949
LOWER BODY CONSTRUCTION FOR MOTOR VEHICLE

Tsutomu Tanimoto, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 27, 1984, Ser. No. 655,075
Claims priority, application Japan, Sep. 28, 1983, 58-151844[U]; Sep. 28, 1983, 58-151846[U]
Int. Cl.[4] B62D *25/20*
U.S. Cl. 296—204 4 Claims



1. A lower body construction for a motor vehicle, comprising:

a pair of first and second side sills which are, respectively, disposed at opposite sides of a body of said motor vehicle so as to extend in a longitudinal direction of said body;

a floor panel which is attached, at opposite first and second side edges thereof, to said first and second side sills, respectively, so as to be disposed between said first and second side sills and is formed, at a substantially central portion thereof in a widthwise direction of said body, with a tunnel portion extending in the longitudinal direction of said body so as to be divided into a pair of first and second floor panel parts by said tunnel portion such that said first and second floor panel parts are, respectively, provided with said first and second side edges; and

a pair of first and second cross members each having a hat-shaped cross section, which are provided on said first and second floor panel parts, respectively, so as to extend in the widthwise direction of said body;

said first cross member being attached, at an inner end portion thereof, to said tunnel portion and being attached, at an outer end portion thereof, to said first floor panel part such that said outer end portion of said first cross member is spaced from said first side sill inwardly in the widthwise direction of said body;

said first floor panel part being formed, in the vicinity of said outer end portion of said first cross member, with a first recess extending downwardly obliquely to said first side edge in the widthwise direction of said body;

said second cross member being attached, at an inner end portion thereof, to said tunnel portion and being attached, at an outer end portion thereof, to said second floor panel part such that said outer end portion of said second cross member is spaced from said second side sill inwardly in the widthwise direction of said body;

said second floor panel part being formed, in the vicinity of said outer end portion of said second cross member, with a second recess extending downwardly obliquely to said second side edge in the widthwise direction of said body, whereby a pair of first and second reinforcement portions each having the hat-shaped cross section are, respectively, constituted by said first cross member and said first recess and by said second cross member and said second recess so as to extend continuously between said tunnel portion and said first side sill and between said tunnel portion and said second side sill, respectively, in the widthwise direction of said body;

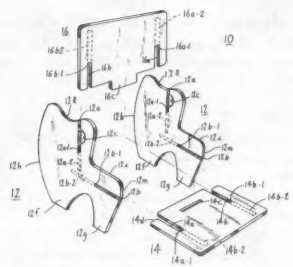
said first and second floor panel parts including, respectively, first and second mounting portions having hat-shaped cross sections;

said first and second cross members are, respectively, provided on said first mounting portion of said first floor panel part and said second mounting portion of said second floor panel part.

4,593,950
COLLAPSIBLE COMBINED ROCKER AND CHAIR

Vittorio Infanti, 3075 Richmond Ter., Staten Island, N.Y. 10303

Filed Apr. 28, 1983, Ser. No. 489,482
Int. Cl.[4] A47C *13/00*
U.S. Cl. 297—3 6 Claims



1. A knock-down chair assembly composed of only four members:

said four members including a pair of identical side pieces and first and second cross pieces;

said side pieces each having a pair of slots communicating with adjacent edges of said side pieces and arranged so that they are oriented substantially at an angle greater than a right angle relative to one another;

said first cross piece having a pair of spaced parallel slots communicating with one edge thereof, and a third slot arranged parallel to and inwardly from said one edge and substantially perpendicular to said pair of slots;

said second cross piece having a pair of slots communicating with one edge thereof and being arranged in spaced parallel fashion;

said second cross piece having an integral elongated projection extending outwardly from said one edge;

the pair of slots of said first cross piece and an associated one of said pair of slots of said side pieces, each slidably receiving one another and extending beyond the slots so that the slots in said side pieces each embrace a portion of said cross piece beyond the parallel slots in the cross piece, and so that the elongated slots in said first cross piece each embrace a portion of one of said side pieces beyond the slots in said side pieces cooperating with the parallel slots in said first cross piece;

the pair of elongated slots in said second cross piece each being slidably received by an associated one of the remaining slots in said side pieces, so that the slots in said second cross piece each embrace a portion of the side pieces beyond the slots received thereby, and so that the remaining slots of said side pieces each embrace a portion of the second cross piece beyond the slots therein;

said third elongated slot in said first cross piece receiving the integral projection of said second cross piece for interlocking said cross pieces to one another and hence, for interlocking said first and second cross pieces and said side pieces;

said side pieces each having an elongated curved side edge, said curved side edge cooperating to rockingly support said chair assembly, whereby said first and second cross pieces, respectively, serve as the rocking chair back and rocking chair seat;

said side pieces each having a pair of integral projections forming a pair of legs along an edge adjacent to and aligned transverse to the curved side edges, said side pieces collectively thereby providing four such legs for supporting said chair assembly when the free ends of such legs rest upon a supporting surface, thereby providing a steady chair.

4,593,951

HYDRAULIC CHAIR LIFT MECHANISM

Mathew A. Slaats, and Patrick E. Strange, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Nov. 5, 1984, Ser. No. 668,307

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—347 **51 Claims**

1. A hydraulic lift mechanism for adjustably supporting an article of furniture comprising:

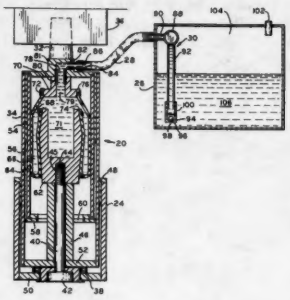
a base;

a reciprocable support member moveable between extended and retracted positions;

a first chamber having a pressurized gas therein;

a second chamber filled with a substantially incompressible liquid and including a flexible wall, the volume of said chamber being variable, said second chamber supported by said base and said support member supported by said second chamber, said support member reciprocating in response to variations in said variable volume;

conduit means connecting said first chamber to said second chamber; and



control means in said conduit means for selectively enabling said conduit means to transfer the liquid between said chambers.

4,593,952

ARTICULATED FITTING FOR VEHICLE SEATS

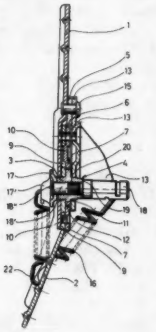
Hans-Joachim Berghof, Remscheid-Hasten, Fed. Rep. of Germany, assignor to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed Dec. 16, 1983, Ser. No. 562,204

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247947

Int. Cl.[4] A47C *1/024*; B60N *1/06*

U.S. Cl. 297—365 **6 Claims**



1. An articulated fitting for vehicle seats, particularly motor vehicle seats, comprising:

a bushing having two end surfaces and a bore therein;

an upper and lower fitting element mounted on the bushing which serves as a hinge pin so that the fitting elements are rotatable and pivotable relative to each other:

a locking device form-fittingly fixing the upper fitting element in selectable pivot positions relative to the lower fitting element, comprising a locking member activated by rotation of the bushing relative to the fitting elements, an activating member nonrotationally connected to one end of the bushing, and a pin nonrotationally connected to the other end of the bushing, said pin having a larger diameter end section, a smaller diameter end section, and a transition section between said larger and smaller diameter end sections;

the transition section of the pin comprising an annular shoulder, said pin being disposed so that said annular shoulder

is adjacent one end surface of the bushing and the smaller diameter end section of the pin is dimensioned so as to fit within the bore of the bushing;

the smaller diameter end section of the pin penetrating both the bore of the bushing and an opening in a section of the activating member abutting the other end surface of the bushing;

the bushing being provided on both end surfaces with axially projecting projections penetrating into the annular shoulder and the section of the activating member, respectively; and

the end of the pin projecting beyond the activating member being formed as a rivet head which holds the annular shoulder and the activating member in forced abutment against the bushing.

4,593,953

APPARATUS FOR COVERING DISC WHEEL FOR MOTOR VEHICLE

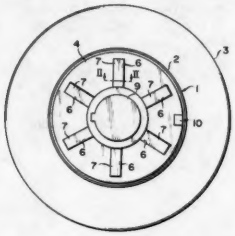
Takeshi Baba, Kasugai; Hiroki Iwasa, Aichi, and Kyozo Ohmi, Anjyo, all of Japan, assignors to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Dec. 10, 1984, Ser. No. 679,945

Claims priority, application Japan, Dec. 14, 1983, 58-192793[U]; Oct. 22, 1984, 59-159897[U]

Int. Cl.⁴ B60B *7/04, 19/10*

U.S. Cl. 301—6 CS **15 Claims**



1. An apparatus for covering a disc wheel supporting a tire for a motor vehicle comprising:

a wheel cover mounted on said disc wheel and covering an outer side of said disc wheel;

at least one ventilation opening in said wheel cover for communicating the inside of said wheel cover with the atmosphere; and

means for closing said ventilation opening when a temperature inside said wheel cover is not more than a predetermined temperature and opening said ventilation opening when the temperature inside said wheel cover is more than said predetermined temperature.

4,593,954

AIR BRAKE VALVE SYSTEM

Sergio Campanini, Iola, Kans., assignor to Hose America, Inc., Iola, Kans.

Filed Oct. 17, 1984, Ser. No. 661,761

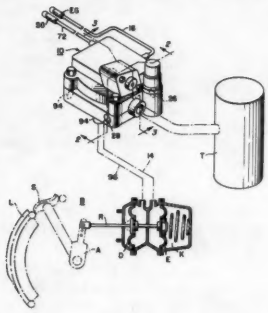
Int. Cl.⁴ B60T *13/22*

U.S. Cl. 303—7 **20 Claims**

1. In a tractor and trailer rig of the type wherein the tractor includes a source of air under pressure and a tractor protection valve that will supply air to the trailer whenever the air pressure is above a minimum supply line pressure and wherein the tractor includes low-pressure warning means operative to warn the driver whenever the air pressure in the tractor is below a predetermined threshold level, and wherein each trailer includes at each axle brake means including compressed air tank means and including spring brake means having actuator means which are compressed-air operated to hold the spring brake means OFF and including service brake means having actuator means which are compressed-air operated to apply the service brake means, and wherein each trailer is coupled to receive compressed air through an emergency gladhand and to receive a service brake air pressure control signal through a service gladhand, a brake valve system for each axle of each trailer, comprising:

(a) valve housing means;

(b) a spring brake valve cluster comprising a non-return check valve connected to receive and pass air pressure from the emergency gladhand and to deliver it directly to the spring brake actuator means, and the spring brake valve cluster further including means operative to measure the air pressure in the emergency gladhand and to open the check valve whenever the measured pressure is below a predetermined spring brake isolation pressure which exceeds said minimum supply line pressure but is low enough to actuate said driver warning means, whereby to protect the spring brake actuator means and



maintain its pressure at the maximum operating emergency gladhand pressure until the latter falls below said isolation pressure;

(c) an air tank supply valve cluster connected between said emergency/supply gladhand and said tank means and operative to fill said tank means, the supply valve cluster comprising a pressure responsive valve operative to sense pressure in the emergency gladhand and to open at pressures above said threshold pressure whereby to pass air to the tank means, and the supply valve cluster further including a tank protecting check valve interposed between the pressure responsive valve and the tank means and continuously operative to prevent backflow of air from the tank means toward the emergency gladhand; and

(d) a service brake relay valve cluster connected between the tank means and the service brake actuator means to supply and modulate air to the latter from the tank means in response to variations in the level of the service brake air pressure signal.

4,593,955

YAW-COMPENSATED VEHICLE ANTI-SKID SYSTEM

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 617,373

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321370

Int. Cl.⁴ B60T *8/64, 8/70*

U.S. Cl. 303—106 **7 Claims**

1. Vehicular automatic anti-brake lock system (ABS) having wheel speed sensors (20) providing wheel speed signals;

a left axle brake control system (22) receiving the wheel speed signals from at least one left wheel of the vehicle;

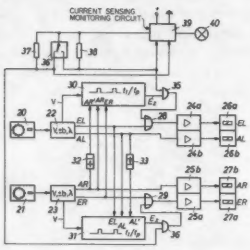
a right axle brake control system (23) receiving the wheel speed signals from at least one right wheel of the vehicle;

the brake control systems controlling admission and drain-

age, respectively, of pressurized brake fluid to a brake of a vehicle wheel on a respective side of the vehicle, in dependence on at least one of: vehicle speed, acceleration (+b), deceleration (−b), wheel slip;

and means to limit yaw upon unsymmetrical frictional relationship between the at least one wheel on the left side of the vehicle and the at least one wheel on the right side of the vehicle,

said means comprising a pair of brake control units (30, 31), one each for the brake of the at least one wheel on the left side of the vehicle and the brake of the at least one wheel on the right side of the vehicle, and being responsive, respectively, to signals controlling admission and drainage



of pressurized brake fluid of the right side and left side, respectively, to thereby control the braking effort on one side of the vehicle (e.g. left side) as a function of the braking effort on the other (then: right side of the vehicle), and comprising, in accordance with the invention,

an accelerometer (36') sensing centrifugal acceleration of the vehicle due to the vehicle passing through a curve;

and control means (36, 35) coupled to the brake control units (30, 31) of the left and right sides of the vehicle, respectively, and inhibiting command of increased brake pressure as a function of centrifugal vehicle acceleration, as sensed by said accelerometer (36'),

said control means (36, 35) being connected to and controlled by said accelerator (36').

4,593,956

LONG TUBE BENDER ELEMENT SQUEEZE BEARING

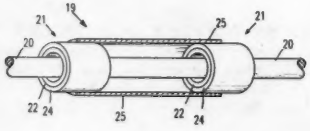
Mark B. Caruso, Pasadena, Calif., and Robert A. Scranton, South Salem, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US82/01828, § 371 Date Aug. 13, 1984, § 102(e) Date Aug. 13, 1984, PCT Pub. No. WO84/02755, PCT Pub. Date Jul. 19, 1984

PCT Filed Dec. 30, 1982, Ser. No. 645,741

Int. Cl.⁴ F16C *32/06*

U.S. Cl. 384—1 **5 Claims**



1. A tubular form of pneumatodynamic bearing including a pair of elements having juxtaposed bearing surfaces wherein said bearing employs resonant flexural oscillation of at least one of said surfaces relative to the other thereof to produce pneumatic pressure within the bearing to separate said bearing surfaces pneumatically with one of said surfaces floating upon said air under pressure,

with said bearing elements including tubularly-shaped means for transducing comprising

a pair of nested tubular members with one nested inside the other thereof,

with at least a segment of said one nested tubular members being in intimate mechanical contact with at least a segment of said other nested tubular member,

with one of said nested tubular members being electrostrictive and providing resonant flexural oscillation of said nested tubular members,

said nested members being in a supporting relationship with another tubular member which includes one of said bearing surfaces comprising,

said bearing having a predetermined length with a given one of said nested tubular members of said means for transducing being substantially shorter than the length of the other of said tubular members and of said bearing,

whereby the weight of said bearing is substantially lower than it would be if said given one of said tubular members were continuous, while the tilting of said bearing surfaces relative to each other is minimized.

4,593,957

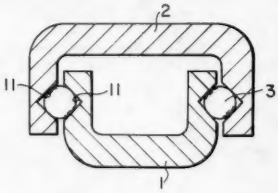
ROLLING BEARING MADE BY THIN STEEL PLATES FOR PROVIDING A RECTILINEAR MOVEMENT

Kengo Hidano, Fujisawa, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,584

Int. Cl.⁴ F16C *21/00, 29/04*

U.S. Cl. 384—49 **5 Claims**



1. A rolling bearing for a rectilinear movement having a table, a bed and a plurality of like rolling bodies, comprising:

a table and a bed each of which is formed due to plastic working so as to have a U-shaped cross section, said table and bed having elasticity;

a pair of track grooves formed in the side walls of said table and bed so as to face each other and have substantially a V-shaped cross-section, respectively; and

track surfaces formed in said track grooves so as to come into contact with said rolling bodies,

wherein said track surfaces are heat treated and ground so as to have sufficient hardness, surface roughness and dimensional accuracy as a rolling bearing; and

the thickness of the side wall at the thinnest portion of each of said table and bed, adjacent said track groove, is either equal to or slightly greater than one-third of the diameter of one of said rolling bodies.

4,593,958

SOCKET FOR BASELESS LAMP

Masaharu Baba, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 12, 1985, Ser. No. 743,807

Claims priority, application Japan, Jun. 14, 1984, 59-88525[U]

Int. Cl.⁴ H01R *9/09*

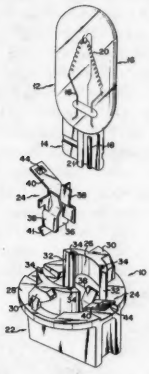
U.S. Cl. 339—17 D **5 Claims**

1. A socket, into which a sealed section of a baseless lamp with a pair of leads provided on the outer surfaces of the sealed section is inserted, and which is mounted to a mounting base

having a printed wiring formed on the surface thereof and an insertion hole, comprising:

a socket body having a bulb insertion cavity for receiving said sealed section of said lamp inserted therein, said socket body being mounted to said mounting base by being inserted through said insertion hole and then turned in a predetermined direction; and

a pair of contact members disposed in said bulb insertion cavity, each of said contact members having a pair of elastic contact portions for clamping said sealed section of the lamp inserted in said bulb insertion cavity and being in contact with said leads, and a power supply terminal outwardly extending from said bulb insertion cavity of



said socket body, said power supply terminal having a contact protuberance formed on a free end portion thereof and in contact with said printed wiring when said socket body is mounted to said mounting base, said contact protuberance having a flat top surface in contact with said printed wiring, a first inclined side surface extending from said flat top surface toward the base end of said power supply terminal, a second inclined side surface extending from said flat top surface in the direction of rotation of said socket body and third and fourth inclined side surfaces opposed to said first and second inclined side surfaces, respectively, said first and second inclined side surfaces being inclined more gently than said third and fourth inclined side surfaces.

4,593,959

DIGITAL SIGNATURE PLUG

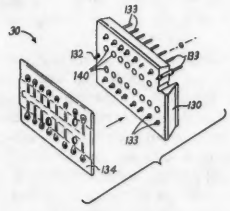
David W. Simms, Christhall, Nr. Royston, England, assignor to Sangamo Weston Limited, Enfield, England

Division of Ser. No. 296,043, Aug. 25, 1981, Pat. No. 4,444,063. This application Oct. 21, 1983, Ser. No. 544,158

Claims priority, application United Kingdom, Aug. 27, 1980, 8027722

Int. Cl.[4] H01R *9/09, 29/00*

U.S. Cl. 339—17 C **3 Claims**



1. A device for providing a selectable multi-bit digital electrical signal to a digital electronic circuit, the device comprising:

an insulating support having an input pin for receiving an input signal of predetermined logic level, and a plurality of output pins for applying said digital signal to said electronic circuit; and

a printed circuit mounted on a surface of said support, said printed circuit comprising a relatively thin sheet of insulating material having electrically conductive tracks on one side thereof, said tracks including a common track electrically connected to said input pin and a plurality of individual tracks each extending from said common track to a respective connection point electrically connected to a respective one of said output pins, the support including hollow areas formed beneath each of said individual tracks to enable a respective track to be readily severed by means of external pressure applied to the track and underlying insulating material disposed over the respective hollow area of the support, whereby any selected combination of said output pins may be selectively electrically disconnected from said input pin to produce said digital signal.

4,593,960

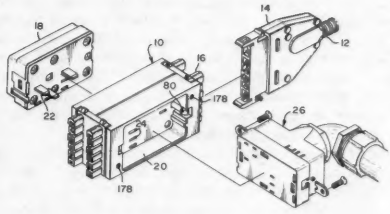
POWER ENTRY CONNECTOR

Wayne L. Millhimes, Hershey, and Daniel J. Murren, Dillsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 27, 1985, Ser. No. 716,715

Int. Cl.[4] H01R *13/44*

U.S. Cl. 339—42 **9 Claims**



1. A power entry connector for being plugged into a duplex-receiving recess in an electrical power junction box or the like for the purpose of bringing power thereinto, comprising:

(a) a housing formed with side, end and back walls which define a cavity with an opening thereto being opposite the back wall, a wire-receiving passage into the cavity through one of the walls and further having removable stop means on one of said side walls;

(b) contact retaining means adapted to retain a plurality of contacts of the type having a tab on one end and wire receiving means on another end, said contact retaining means being positionable in the cavity such that tabs on contacts which may be retained will extend out through the opening and the wire receiving means will be near the passage to receive wires which may be inserted into the cavity through the passage;

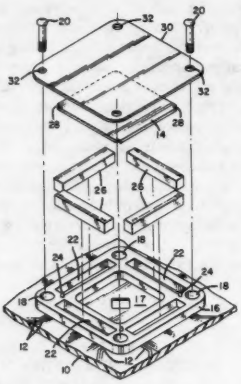
(c) a cover formed with side, end and front walls which define a cavity with an opening thereto being opposite the front wall, and further, a plurality of slits through the front wall, said cover being telescopingly and slidably mounted onto the housing so as to cover the opening to the cavity therein and, when in a first location, to cover tabs which may be extending through the opening, but when in a second location further onto the housing said tabs will extend through the slits; and

(d) means for biasing said cover in said first location.

4,593,961
ELECTRICAL COMPRESSION CONNECTOR

Nicola Cosmo, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1984, Ser. No. 683,849
Int. Cl.[4] H01R 9/09
U.S. Cl. 339—61 M 18 Claims



1. An electrical connector for electrically connecting first and second circuit members, each member having a surface including conductive means, comprising:

a dielectric member of compressible elastomeric material;

substantially rigid electrically-conductive linear rod members secured at spaced intervals in said dielectric member and extending through said dielectric member substantially normal to a longitudinal axis of said dielectric member; said rod members extending at an acute angle with respect to the surfaces of the circuit members when in electrical engagement therewith; and

ends of said rod members extending outwardly from different surfaces of said dielectric member and electrically engageable with respective conductive means of the first and second circuit members upon said dielectric member being pressed against the surfaces of the circuit members in a direction to bring the ends of the rod members into electrical engagement with respective conductive means.

4,593,962
ELECTRICAL PLUG AND SOCKET CONNECTION

Peter Knorreck, Weissach, and Manfred Krämer, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE83/00074, § 371 Date Dec. 5, 1983, § 102(e) Date Dec. 5, 1983, PCT Pub. No. WO83/04143, PCT Pub. Date Nov. 24, 1983
PCT Filed Apr. 21, 1983, Ser. No. 561,599
Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216984
Int. Cl.[4] H01R 4/00
U.S. Cl. 339—94 M 9 Claims

1. Pressure-tight, strain relieved plug-and-socket connection, releasably and pressure and liquid tightly connecting an electrical cable (33, 50) to electrical conductors (55) located internally within a housing (1; 45; 57, 59) capable of retaining fluid under pressure, having

a plug part (3, 49, 53);

a socket part (16) connectable with the plug part;

an electrical cable (33, 50) having cable elements (32) located therein secured in one of said parts, said other part being fitted in an opening (2) formed in the housing;

terminal prong elements (11) and terminal reception elements (29) secured in respective ones of the parts, and comprising

a projecting sleeve portion (8) of insulating material formed on said other part extending through the opening (2), and sealingly retaining one of said terminal elements and forming therewith a unitary plug part,

sealing means (4, 53, 56) sealing said unitary plug part in the opening in the wall of the housing;

and means for sealingly connecting the socket part and the plug part including

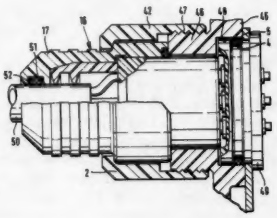
a carrier sleeve (17) having an outer guide surface (19) formed thereon, one end of the carrier sleeve being formed with an opening for passage of the cable (33, 50) therethrough, and another end fitting against an end face of the projecting sleeve portion (8);

an inner contact receiving bushing (18) of insulating material formed with chambers (28) facing the plug part, the other terminal elements matching said one terminal element being received in the chambers of the receiving bushing,

said carrier sleeve (17) being formed with an opening dimensioned to receive the contact receiving bushing 18;

inter-engaging projection-and-recess means (26, 20) being formed on the contact receiving bushing (18) and the carrier sleeve, respectively, to lock the contact receiving bushing within the carrier sleeve;

a sealing ring (25) surrounding the contact receiving bushing (18) and located between the other end face of the carrier sleeve (17) and the end face of the projecting sleeve portion (8);



an end plate (34) located against and supported on the end face of the contact receiving bushing (18) opposite the chambers, and formed with openings to permit passage of the cable elements (32) of the cable (33, 50) to respective ones of the other terminal elements (29);

a sealing disk (37) formed with sealing openings for the cable elements, located against said end plate and sealing the passage of the cable elements (32) with respect to the end plates;

a clamping sleeve (39) located within the carrier sleeve (17) and having an outer end portion bearing against the inside of the carrier sleeve and an inner end portion bearing against said sealing disk;

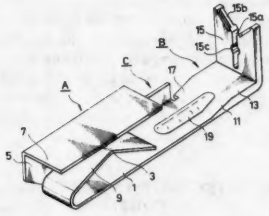
strain relieving corrugations (40) formed on said clamping sleeve and engaging the cable in the region of the passage of the cable out of the carrier sleeve and adjacent the opening at said one end for passage of the cable therethrough;

and a union nut (42) engaging the outer surface of the carrier sleeve (17) and the projecting sleeve portion (8) of the other part for coaxially clamping the carrier sleeve (17) against the projecting sleeve portion (8) of the other part and thereby clamping together the clamping sleeve (39), the sealing disk (37), the end plate (34), the sealing ring (25), and the contact-receiving bushing (18) into a liquid-tight unit, said union nut (42) having an inner surface extending over and being guided by a longitudinal portion of the outer guide surface (19) of the carrier sleeve (17).

4,593,963
WIRE-HARNESS FOR AUTOMOBILES

Takayoshi Endo, Shizuoka; Toshimasa Sugiyama, Numazu; Satoru Murofushi, Shizuoka, and Sakai Yagi, Gotenba, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,419
Claims priority, application Japan, Oct. 26, 1983, 58-199163
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—97 R **12 Claims**



1. A wire harness of the slotted terminal type, comprising:

a first terminal contact portion including a base, a resilient contact tang integral with the base and bent over the base, and a side extension integral with the base and folded upward to form a side wall substantially perpendicular to the base and a top wall substantially parallel to the base, wherein the top wall is arranged to define a clearance for receiving a terminal and disposed between the top wall and the resilient contact tang;

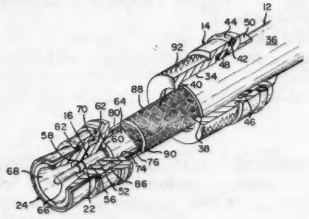
a second wire connecting portion, connected to the terminal contact portion, having a thickness greater than the thickness of the terminal contact portion, and including a sloped transition adjacent to the terminal contact portion, and a distal end for defining a wire connecting section, wherein the distal end is bent upwards and includes a slotted opening having tapered edges for guiding a wire, and having arcuate recesses for receiving the wire under pressure,

a reinforcing member for increasing the strength of the transition section and a connection between the first and second portions.

4,593,964
COAXIAL ELECTRICAL CONNECTOR FOR MULTIPLE OUTER CONDUCTOR COAXIAL CABLE

Edgar W. Forney, Jr., Harrisburg, and Richard S. Hogendobler, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 475,572, Mar. 15, 1983, Pat. No. 4,553,806. This application Oct. 3, 1983, Ser. No. 538,449
Int. Cl.[4] H01K *17/18*
U.S. Cl. 339—177 R **4 Claims**



1. A coaxial electrical connector for termination onto a center conductor and multiple outer conductors of a coaxial cable, comprising:

center contact means electrically connectable with the center conductor;

ferrule element means disposable between an outer dielectric sheath and an outer conductor of the multiple outer conductors;

inner contact assembly means including inner contact means having inner dielectric means secured therein and ferrule section means along which an inner conductor of the multiple outer conductors is to be positioned, said inner dielectric means having a bore in which said center contact means is to be disposed, crimping member means for crimping the inner conductor to said ferrule section means;

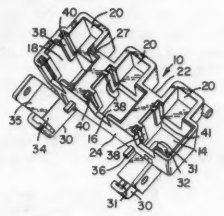
outer contact assembly means including outer contact means having ferrule member means, outer dielectric means secured within said outer contact means, said outer contact means being positionable onto said inner contact assembly means with said outer dielectric means engaging said inner contact means and said ferrule member means being crimpable onto said ferrule element means thereby crimping the outer conductor therebetween, and wherein said outer contact means further includes a strain relief ferrule section disposed beyond said sealing section with respect to said outer contact means and said ferrule member means and crimpable onto an outer jacket of the cable; and

sealing section means as part of said outer contact means including sealing means disposed therewithin and sealingly engageable with the outer jacket of the cable.

4,593,965
ELECTRICAL CONNECTOR FOR MATING WITH THREE ORTHOGONALLY ARRANGED TABS

Jean C. Joly, Osny, France, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 1, 1984, Ser. No. 656,633
Claims priority, application France, Sep. 29, 1983, 83 15506
Int. Cl.[4] H01R *33/72*
U.S. Cl. 339—192 R **9 Claims**



1. An electrical connector for mating with three electrical tabs projecting in spaced orthogonal array from a base, two of the tabs being in parallel planes and opposed relation and the plane of the third tab, which tab is positioned adjacent edges of the two other tabs and between the planes of the two other tabs, extending transversely thereof; the connector comprising an elongate insulating housing defining three cavities each containing an electrical terminal comprising a tab-engaging contact for making electrical connection with one of the tabs when the connector has been mated with the tabs; characterised in that each terminal comprises first and second tab-engaging contacts connected together in spaced, opposed relationship, the cavities being arranged in line and the terminals all being angularly oriented in the same way with respect to the housing, which is a rigid structure, with one tab-engaging contact of each terminal adjacent to one wall of the housing and the other adjacent to the opposite wall thereof, the centre cavity communicating with the interior of a first tab receptacle formed in the one wall of the housing and each of the two end cavities communicating with the interior of respective second

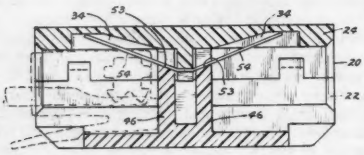
and third tab receptacles formed in the opposite wall of the housing, each tab contact projecting into the interior of the tab receptacle which is adjacent thereto, for engaging a tab when such has been inserted into the tab receptacle.

4,593,966

MODULAR TELEPHONE LINE COUPLER

Daniel Meyer, Hector, Minn., assignor to Communications Systems, Inc., Hector, Minn.

Filed Sep. 17, 1984, Ser. No. 650,689
Int. Cl.[4] H01R *13/502*
U.S. Cl. 339—205 **16 Claims**



1. A modular coupler for interconnecting two modular plug-ended lines comprising:

a first section having a center wall extending in a widthwise direction;

a second section having first and second forming walls extending in a widthwise direction and spaced apart to form an aperture of a size to receive therebetween and center wall of the first section;

a plurality of electrical contact elements positioned parallel to each other over the center wall and the first and second forming walls and extending in a lengthwise direction with respect to the first and second sections; and

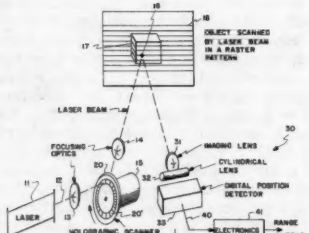
means to retain the first and second sections in an assembly, the center wall of the first section projecting between the first and second forming walls of the second section to clampingly hold the plurality of contact elements, the contact elements being bent over the center wall and extending toward opposite ends of the assembly, the first and second sections forming at the opposite ends two hollow cavities for securing the two modular plug-ended lines which are electrically interconnected by the plurality of contact elements.

4,593,967

3-D ACTIVE VISION SENSOR

Paul R. Haugen, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 1, 1984, Ser. No. 667,312
Int. Cl.[4] G02B *26/10*; G01C *3/00*; G01B *11/24*
U.S. Cl. 350—3.71 **23 Claims**



1. A real-time three-dimensional active vision sensor system comprising:

scanner means scanning a focussed light beam across the surface of an object so that an illuminated spot scans across said surface, the object to be 3-D range mapped, in which the scanning angle θ of the light beam is continuously changing during each scan;

light receiving means including digital angle sensor means, said digital angle sensor means being positioned a fixed distance "d" from said scanner means to detect the angle γ from which the light is being received from said surface due to said light beam, and to provide a digital output which is representative of the angle γ from which the light is being received; and,

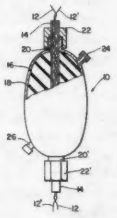
electronic means connected to the digital angle sensor means for converting by triangulation the distance "d" (separating the scanner means and digital angle sensor means) and instantaneous values of angle θ and angle γ to absolute x,y,z coordinates representative of the instantaneous position of the light beam at the object surface.

4,593,968

POTTING TECHNIQUES FOR FIBER OPTICAL COUPLERS

Thomas G. Giallorenzi, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 22, 1981, Ser. No. 227,340
Int. Cl.[4] G02B *6/26, 6/42*
U.S. Cl. 350—96.15 **20 Claims**



1. A coupler for coupling light from one optical fiber to another comprising:

at least two cladded single mode core optical fibers helically twisted together in close adjacency along coextensive portions with the claddings of the helically twisted together optical fibers having thicknesses approximately equal to the diameter of the single mode optical core whereby light carried in one fiber is evanescently coupled into at least one adjacent fiber;

support fiber means having cross-sectional dimensions substantially greater than that of the optical fibers coextensively disposed along a length of the twisted optical fibers for defining longitudinal and lateral reinforcement therefor, and having a coefficient of thermal expansion substantially equal to that of the optical fibers to minimize stress therebetween; and

an encapsulant surrounding the optical fibers and adhered to the support fiber reinforcement and having an index of refraction lower than that of the optical fiber cores to prevent coupling out of light from the cores.

4,593,969

RUGGEDIZED GRATED OPTICAL FIBER

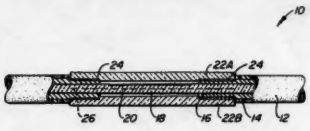
Jack E. Goodman, Germantown, and Donald C. Schmadel, Kensington, both of Md., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 28, 1983, Ser. No. 546,609
Int. Cl.[4] G02B *6/34*
U.S. Cl. 350—96.19 **12 Claims**

1. A ruggedized grated optical fiber comprising:

an optical fiber wherein a portion of the outer cladding has

been removed to expose an inner sheathing and a portion of said inner sheathing has been removed to expose an inner core upon which gratings have been formed;



two semi-tubular sections fitting around said inner sheathing and forming a tube over said gratings;

and hermetically joining means for sealing said sections into said tube and hermetically sealing said tube around said inner core.

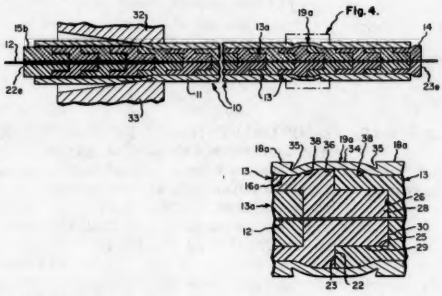
4,593,970

FIBER OPTIC FEEDTHROUGH MODULE, AND METHOD OF MAKING SAME

Geoffrey M. Rhodes, Orchard Park, N.Y., assignor to Conax Buffalo Corporation, Buffalo, N.Y.

Filed May 25, 1983, Ser. No. 497,857
Int. Cl.[4] G02B 7/26
U.S. Cl. 350—96.20 **10 Claims**

Fig. 4.



1. A fiber optic feedthrough module, comprising

(a) a metal sleeve,

(b) a fiber optic element extending through said sleeve in spaced relation thereto, and

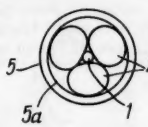
(c) a tandem series of centrally-apertured mating annular sealant bodies of thermoplastic material surrounding said element and compressed between said sleeve and element.

4,593,971

CENTERING CELL FOR CONNECTING OPTICAL FIBERS

Jean-Joseph Clement, Vanves, and Claude A. Lafuente, Carros, both of France, assignors to Les Cables de Lyon, Clichy, France

PCT No. PCT/FR82/00153, § 371 Date May 20, 1983, § 102(e) Date May 20, 1983, PCT Pub. No. WO83/01123, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 21, 1982, Ser. No. 503,197
Claims priority, application France, Sep. 23, 1981, 81 17953
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 **5 Claims**



1. A device for butt connecting a first optical fiber end to a second optical fiber end, said device comprising:

two identical centering cells,

each cell receiving an optical fiber end and having a fiber receiving end and a connection end,

each cell comprising at least three longitudinal, parallel and surface cylindrical abutting rods leaving an axial void therebetween for receiving an optical fiber,

said rods being surrounded by a cartridge, said cartridge applying permanent pressure to the rods,

at least one of said rods being made of a resiliently deformable material,

the connection end of said rods being convex and the convex ends of said rods being in the same plane perpendicular to the rods, and

means for inducing resilient forces tending to center the cells relative to each other when the cells are pressed axially together with their connection ends, one against the other, and the end of each optical fiber being in a plane rearward from the plane of the rod ends but close enough thereto for allowing both fiber ends to be applied one against the other when both cells are applied axially against each other, and

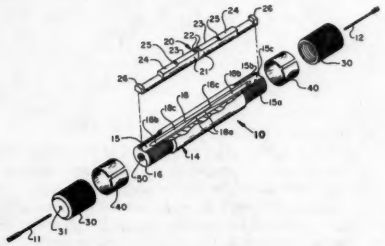
wherein on the fiber entry end of said centering cells, the cell body includes a deformable portion 9*b* fitted with a flexible internal lining 13 for crimping to an optical fiber.

4,593,972

CONNECTOR FOR OPTICAL FIBERS

Lloyd H. Gibson, Rte. 2, Box 109N, Espanola, N. Mex. 87532

Filed Apr. 2, 1984, Ser. No. 596,240
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 **9 Claims**



8. A connector for detachably joining the ends of a pair of optical fibers in abutting and coaxial alignment comprising

an elongate positioning barrel, said barrel having a recess disposed in the outer surface thereof and extending longitudinally the length of said barrel to define a track, the bottom of said track having disposed therein a continuous, longitudinal V-form groove defining identical positioning means disposed in end-to-end relation longitudinally of said barrel for each of said fibers, said groove including first rectilinear alignment portions disposed adjacent each other and in coaxial alignment, second alignment portions disposed proximate opposite ends of said barrel for receiving fibers, and third alignment portions interconnecting said first and second alignment portions, said alignment portions being disposed in the same plane with the open sides of said third alignment portions forming a dihedral angle relative to the open sides of said second alignment portions, said fibers being held in said third alignment portions of said groove by a biasing stress created on the fibers as the fibers are advanced from said second alignment portions along said groove, the depth of said V-form groove progressively diminishing in and along said third alignment portions into said first rectilinear alignment portions, the cross section of said V-form groove in the first rectilinear alignment portions being of a size and shape to only partially receive said fibers with a portion of said fibers projecting beyond said groove, a pair of elongate clamping plates received in the recess track of said

barrel, said track limiting movement of said plates transversely while permitting longitudinal movement of said plates within said track,

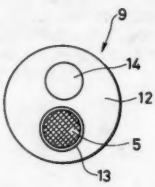
lugs detachably received on opposite ends of said barrel, said lugs having openings therein for receiving said fibers in open communication with said second alignment portions of said V-form groove, said lugs operatively engaging said plates and positioning said plates longitudinally relative to said barrel in end-to-end relation, and a pair of resilient retaining means for detachably securing said plates against the open sides of said V-form groove in said barrel for holding said fibers within said first alignment portions of said groove to maintain coaxial alignment between said fibers.

4,593,973

COMPOSITE OPTICAL FIBER AND IMAGING CATHETER AND METHOD FOR PRODUCING THE SAME

Kenichi Yoshida; Kimizo Ono, and Koichi Tsuno, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 27, 1983, Ser. No. 507,643
Claims priority, application Japan, Jun. 26, 1982, 57-110151
Int. Cl.[4] G02B *6/02;* B29D *11/00*
U.S. Cl. 350—96.29 **13 Claims**



1. A composite optical fiber, comprising:

a light-receiving imaging optical fiber, having a first index of refraction, which transmits information-carrying light reflected from a target to a sensor; and

a first transparent sheath, having a second index of refraction which is lower than said first index of refraction, which transmits illuminating light from a light source to a target to be viewed, said light-receiving imaging optical fiber being contained within an interior portion of said transparent sheath and is an integral part thereof, wherein said transparent material is extruded to cover said light-receiving optical fiber; and

a light-absorbing layer formed around said imaging optical fiber and within said interior portion of said transparent material for preventing leakage of reflected light from said transparent material to said imaging optical fiber, said light-absorbing layer having an index of refraction lower than said first index of refraction.

4,593,974

PLASTIC OPTICAL FIBER

Takashi Yamamoto, Hiroshima; Kozi Nishida, Otake, and Akio Tateishi, Tokyo, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,245
Claims priority, application Japan, Dec. 24, 1982, 57-230436
Int. Cl.[4] G02B *6/00*
U.S. Cl. 350—96.34 **14 Claims**

1. A plastic optical fiber comprising:

(1) a core consisting of a polymeric material and having a refractive index n_1,

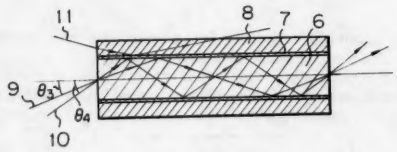
(2) a cladding layer consisting of a polymeric material and having a refractive index n_2, and

(3) a protective layer consisting of a polymeric material and having a refractive index n_3, which optical fiber is characterized in that said refractive indices n_1, n_2, and n_3 satisfy the relationships

$$n_1 - n_2 \geqq 0.01$$

and

$$n\,3 - n_2 > 0$$



and in that said cladding layer-forming polymeric material consists essentially of a copolymer of:

(A) 20% to 99.95% by weight of at least one fluorine-containing-comonomer selected from the group consisting of fluoroalkyl acrylates and fluoroalkyl methacrylates;

(B) 0.05% to 10% by weight of at least one vinyl comonomer having a hydrophilic radical; and

(C) 0% to 79.95% by weight of at least one other vinyl comonomer capable of copolymerizing with the abovementioned comonomers (A) and (B).

4,593,975

IMAGE-TRANSMITTING SYNTHETIC RESIN ROD AND A PROCESS FOR PRODUCING THE SAME

Jun Nakauchi, and Yasuteru Tahara, both of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1983, Ser. No. 548,445
Claims priority, application Japan, Nov. 9, 1982, 57-196590
Int. Cl.[4] C08F *120/32;* G02B *5/14*
U.S. Cl. 350—96.34 **13 Claims**

1. A method of modifying the structure of a (meth)acrylate rod such that it has a refractive index distribution that satisfies the equation (1):

$$n_r^2 = n_a^2[1-(gr)^2+h_4(gr)^4+h_6(gr)^6] \quad (1)$$

$$0.03 \leqq gr_0 \leqq 0.45$$

$$|h_4 - \tfrac{1}{3}| \leqq 100$$

$$|h_6 + 17/45| \leqq 1{,}000$$

wherein r is the radial distance from the center axis of the rod ($0 \leqq r \leqq r_0$),

r_0 is the radius of the rod,

n_r is the refractive index at point r,

n_a is the refractive index at the center of the rod,

g is the distribution constant of the refractive index, and

h_4 and h_6 are high order coefficients

in a cross section taken perpendicular to the center axis of the (meth)acrylate resin rod, which comprises the steps of:

(a) swelling a rod formed from a glycidyl(meth)acrylate resin or a resin formed by polymerizing at least one glycidyl(meth)acrylate monomer with another copolymerizable monomer such that the polymer product has a glycidyl group content of at least 10 mole % with a swelling agent such that the rods satisfies the conditions of equation (2):

$$1.1 \leqq V/V_o \leqq 3.0 \quad (2)$$

wherein V_o is the volume of the rod before immersion in the

swelling agent, and V is the volume of the rod after immersion and swelling in said swelling agent until the volume has substantially stabilized;

(b) immersing the swollen rod in a solution containing a compound having at least one fluoroalkyl group, wherein the fluorine bearing carbon atom content in said at least one group ranges from 1 to 8, said compound having a refractive index 0.15–0.35 lower than that of the acrylic resin of the rod and a reactivity to the epoxy groups in the glycidyl component of said resin such that the treated rod satisfies the condition of

$$0.8 \leqq V'/V \leqq 1.2 \quad (3)$$

wherein V' is the volume of the rod after immersion in said solution at a constant temperature for a predetermined period of time; and then

(c) drying the rod.

4,593,976

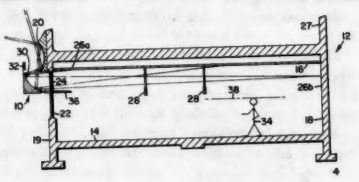
SOLAR ILLUMINATION DEVICE

David A. Eijadi, St. Paul, and David J. Bennett, Minneapolis, both of Minn., assignors to Bennett, Ringrose, Wolsfeld, Jarvis, Gardner, Inc., Minneapolis, Minn.

Filed May 22, 1985, Ser. No. 737,030

Int. Cl.[4] G02B *17/00, 27/00*

U.S. Cl. 350—260 **18 Claims**



1. a solar concentrator for illuminating the interior of a building through a side wall thereof, said concentrator, comprising:

a stationary reflective collector located to view the sky and having a plurality of discrete planar collector surfaces mounted in abutting relationship, each said collector surface installed at an angle with respect to the vertical different from said angle of installation of said abutting collector surfaces;

a stationary reflective reflector positioned to receive direct solar energy reflected by said collector and oriented to reflect such energy toward a target within said building, said reflector having a plurality of discrete planar reflector surfaces each said reflector surface mounted in abutting relationship, each said reflector surface installed at an angle with respect to the vertical different from said angle of installation of said abutting reflector surfaces;

a low angle shield means for preventing direct solar rays from entering unreflected into said building between said collector and said reflector and penetrating a horizontal plane above the floor of said building, said horizontal plane spaced from said floor a distance substantially equal to the height of the eye of an occupant standing on the floor of said building, said low angle shield means including an opaque material and being affixed to said reflector; and

a shield means for preventing rays reflected by said collector and said reflector from penetrating said horizontal plane, said shield means affixed to said building and extending in a generally horizontal direction.

4,593,977

CELL CONSTRUCTION FOR COLOR LIQUID CRYSTAL DISPLAY DEVICES

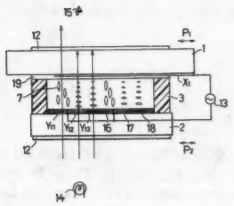
Toshiaki Takamatsu, Tenri; Fumiaki Funada, Yamatokoriyama; Masataka Matsuura, Tenri, and Tatuo Uchida, Sendai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 415,908, Sep. 8, 1982, abandoned. This application Jun. 20, 1985, Ser. No. 746,764

Claims priority, application Japan, Sep. 14, 1981, 56-146505; Sep. 14, 1981, 56-146506

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—339 F **4 Claims**



1. A color matrix liquid crystal device comprising in combination;

(a) a light source,

(b) a pair of polarizers having a pair of opposing transparent substrates sandwiched therebetween,

(c) a pair of transparent linear electrodes facing each other provided on each of said substrates to form a matrix electrode structure wherein the intersections of the electrodes define picture elements for display,

(d) a liquid crystal composition provided between said substrates, and

(e) transparent layers for orientation of said liquid crystal composition formed over the surface of each of said electrodes, each of said orientation layers being composed of a polyimide resin containing transparent red, green and blue inks, to form a combined color filter and liquid crystal orientation layer, said layer providing red, green and blue (RGB) patterns corresponding to said picture elements.

4,593,978

SMECTIC LIQUID CRYSTAL COLOR DISPLAY SCREEN

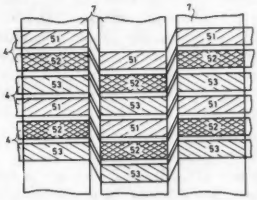
Bruno Mourey, Boulogne Billancourt, and Michel Hareng, La Norville, both of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 19, 1984, Ser. No. 590,644

Claims priority, application France, Mar. 18, 1983, 83 04479

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—339 F **5 Claims**



1. A smectic liquid crystal display screen of the matrix display type comprising a network of heating electrodes and a network of video electrodes surrounding a smectic liquid

crystal layer, said screen restoring a color image from polychromatic radiation incident to the screen, said image being the resultant of the elementary display points formed by the intersection of the heating electrodes and the video electrodes, said screen also comprising means for selecting at least two primary colors of said radiation, said selection means being formed from filtering deposits placed at the elementary display points and supported by the electrodes of a least one of said networks, said filtering deposits being grouped in multiplets of primary colors, wherein the configuration of the electrodes and the arrangement of the multiplets are such that the filtering elements in the same alignment effect differentiated filtering so as to avoid alignment of the deposits of the same color.

4,593,979

TILTING MICROSCOPE BINOCULAR BODY

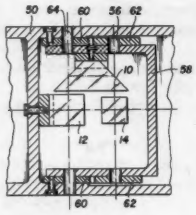
Klaus P. Schindl, Vienna, and Peter B. Puxkandl, Neugasse, both of Austria, assignors to C. Reichert Optische Werke AG, Vienna, Austria

Filed Sep. 21, 1984, Ser. No. 653,004

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334690

Int. Cl.[4] G02B *21/20, 23/04*

U.S. Cl. 350—514 **4 Claims**



1. In a microscope having a housing, an inclinable assembly with two eyepieces and an optical system for diverting light from a single vertical observation axis to a plurality of variably inclinable eyepiece axes,

the improvement comprising;

a first optical means (**12**) mounted in said housing to divert light from the observation axis (**22**) to a horizonal axis (**16**);

an optical bridge (**10**) for receiving light on said horizonal axis and pivotably connected to said housing for rotation about said horizonal axis, said optical bridge having a bridge axis (**20**), the angle between the observation axis and bridge axis not exceeding 90°, said optical bridge exiting light along an exit axis (**18**), said exit axis being spaced from and parallel to said horizontal axis,

a beam splitter (**26**) for separating light received along said exit axis into two portions, said beam splitter being pivotably connected to said optical bridge for rotation about said exit axis,

first means (**28**) for diverting one of said two portions to one of the two eyepieces,

second means (**30, 34**) for diverting the other of said two portions to the other of the two eyepieces, and

means mechanically connecting said beam splitter, first means and second means to said housing to vary the angle of the light they divert as the optical bridge pivots,

whereby the angle of the eyepieces, relative to the observation axis may be selectively varied to accomodate an individual user's preference.

4,593,980

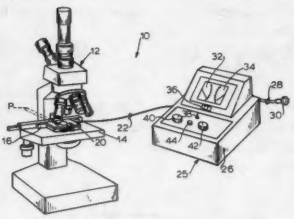
MICROSCOPE ASSEMBLY FOR MAGNETIC SPECIMENS

Abraham Schwartz, Durham, N.C., assignor to Magnetic Activated Particle Sorting, Inc., Carrboro, N.C.

Filed Feb. 21, 1985, Ser. No. 703,709

Int. Cl.[4] G02B *21/26, 21/30*

U.S. Cl. 350—529 **8 Claims**



1. A microscope assembly, comprising:

(a) a light microscope having a stage, a viewing path through said stage and securing means for securing to said stage subjects being examined in said viewing path;

(b) a structure of non-magnetic material secured to said stage by said securing means and having a vertical opening extending therethrough and coinciding with said microscope viewing path, said structure forming a shallow well within said opening for holding a fluid with magnetically responsive particles, said well having an optically clear bottom wall establishing and aperture coinciding with said microscope viewing path; and

(c) a magnetic field source mounted in said structure and having a pair of closely spaced opposed poles located below and immediately adjacent said bottom wall aperture and laterally offset from the axis of said viewing path, said field source being operative to pull said particles over said bottom wall to assume a position near said poles.

4,593,981

BIFOCAL CONTACT LENS

Joseph F. Scilipoti, Bayside, N.Y., assignor to Master Contact Lens Labs Inc., Elmont, N.Y.

Filed May 6, 1983, Ser. No. 492,351

Int. Cl.[4] G02C *7/04, 7/06*

U.S. Cl. 351—161 **5 Claims**

1. A bifocal contact lens made of a transparent contact-lens material and having an anterior surface of a selected curvature and a posterior concave surface having a peripheral portion for near viewing and having a spherical curvature and with a radius of curvature designed to fit the surface of a wearer's cornea with a parallel fit, and not a tight fit, so that a layer of tear liquid is maintained in a gap between said posterior surface and said cornea, and a central portion for distant viewing in the form of a depression in said posterior surface for holding tear liquid, the diameter of said central portion being at least 3.5 mm and its curvature being a spherical curve, which tear liquid

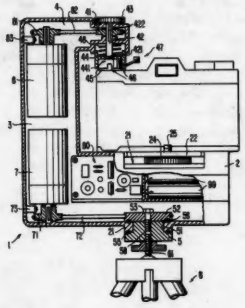
in the depression acts as part of the lens system, the surface of said depression having a radius of curvature shorter than that of said peripheral portion; and a transparent zone of said posterior surface at the junction of said peripheral and central poritons, which zone is of rounded and smooth shape and from 0.1 mm to 0.4 mm in which so as to provide a gradual transition from the curvature of said peripheral portion to the curvature of said depression.

4,593,982

DEVICE FOR TAKING PANORAMIC PHOTOGRAPHS WITH ORDINARY CAMERAS

Ivo Rosset, Pordenone, Italy, assignor to I.C.C. -Integrated Camera Complements s.r.l., Pordenone, Italy

Filed Oct. 26, 1984, Ser. No. 665,433
Claims priority, application Italy, Oct. 26, 1983, 45730 A/83
Int. Cl.[4] G03B *37/02*
U.S. Cl. 354—99 **12 Claims**



1. A device for taking panoramic photographs with an ordinary camera, comprising:

a support means adapted to fixedly support a camera;

a first drive mechanism attached to said support means for causing said support means to be rotated with respect to a fixed support;

a second drive mechanism attached to said support means, said second drive means including means operatively connected to cause rotation of a rewind spindle of a camera mounted on said support means; and

control circuit means operatively connected to said first and second drive mechanisms for monitoring and regulating individually the rates of rotation of said first and second drive mechanisms, said control circuit means causing the rate of rotation of a camera body attached to said support means to be maintained constant and causing the rate of rotation of a rewind spindle of a camera body attached to said support means to be varied as the film is wound around the rewind spindle so that the advance rate of film being exposed in the camera body is regular and uniform.

4,593,983

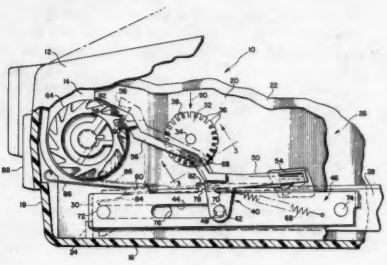
PHOTOGRAPHIC APPARATUS HAVING A FILM CASSETTE COUNTER

Kenneth J. Launie, Cambridge, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 18, 1984, Ser. No. 682,989
Int. Cl.[4] G03B *17/18, 17/36*
U.S. Cl. 354—217 **8 Claims**

1. Photographic apparatus for locating a film cassette in position for sequential exposure of a plurality of film units contained therein, said photographic apparatus comprising:

means for defining a chamber for receiving and locating a film cassette in position for sequential exposure of a plurality of film units contained therein; means for recording a number of film cassettes which have been inserted into said chamber; means for sensing movement of a film cassette into said chamber; and



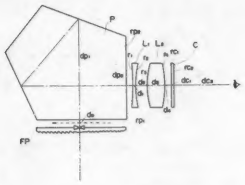
means for interconnecting said sensing means and said recording means, said interconnecting means being adapted to index said recording means to a next highest number each time that said sensing means indicated movement of a film cassette into said chamber.

4,593,984

VIEWFINDER LENS SYSTEM

Kazuo Kimura, Sakai; Hiromu Mukai, Kawachinagano, and Taro Shibuya, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 12, 1985, Ser. No. 711,084
Claims priority, application Japan, Mar. 12, 1984, 59-47737
Int. Cl.[4] G03B *13/02;* G02B *3/02*
U.S. Cl. 354—219 **14 Claims**



1. A viewfinder lens system comprising from an object side to an eye side;

a first lens element having a negative refractive power; and

a second lens element having an optical axis and a positive refractive power with an air space formed between the first and second lens elements, wherein the second lens element has an aspheric surface at its object side whose radius of curvature increases in accordance with an increase in height from its optical axis; and

the viewfinder lens system fulfills the following conditions;

$$0.4<R_2/f<1.2$$

$$0.35<R_3/R_2<0.8$$

$$-1.5<R_4/f<-0.5$$

$$-0.8<\epsilon<0$$

$$25<\nu_1<35$$

$$55<\nu_2<65$$

wherein:

R_2 represents a radius of curvature of an eye side surface in the first lens element;
R_3 represents a paraxial radius of curvature of an object side surface in the second lens element;
R_4 represents a radius of curvature of an eye side surface in the second lens element;
f represents a focal length of the whole lens sytem;
ν_1 represents an Abbe number of the first lens element;
ν_2 represents an Abbe number of the second lens element; and
ϵ represents an aspheric coefficient of the aspheric surface provided by

$$X = (R_3 - \sqrt{R_3^2 - \epsilon Y^2}\ )/\epsilon$$

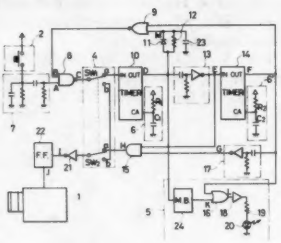
wherein, X represents a distance, measured along a direction parallel with the optical axis, from a center of the aspheric surface to a point on the aspheric surface at a height, Y, from the optical axis.

4,593,985

AUTOMATIC PHOTOGRAPHING DEVICE FOR VIDEO CAMERA

Tadashi Minakuchi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,346
Claims priority, application Japan, Nov. 7, 1983, 58-209531
Int. Cl.[4] G03B *1/00, 17/40*
U.S. Cl. 354—238.1 **4 Claims**



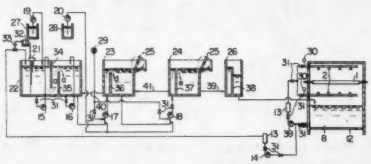
1. An automatic photographing device for a video camera, comprising:
a photographing section;
a trigger switch for controlling the start and stop of a picture recording operation of said photographing section;
switch means for selecting between a manual photographing operation and an automatic photographing operation;
timer means for establishing for said automatic photographing operation a period of time which elapses from an instant said trigger switch is turned on until a picture recording operating of said photographing section is started and a period of time which elapses from an instant said picture recording operation is started until said picture recording operation is stopped;
electronic display means responsive to said timer means for indicating operating states of said photographing section;
said timer means comprises first and second timer devices, a trigger input of said first timer device being coupled to an output of said trigger switch, and a trigger input of said second timer device being coupled through said switch means to a control input of said photographing section;
said first and second timer devices comprise respective first and second timer controller circuits for establishing said period of time which elapses from an instant said trigger switch is turned on until said picture recording operation of said photographing section is started and said period of time which elapses from said instant said picture recording operation is started until said picture recording operation is stopped, respectively; and
a first pulse generator circuit coupled between said trigger switch and said trigger input of said first timer device, a second pulse generator coupled between an output of said first timer device and said trigger input of said second timer device, and a third pulse device and said control input of said photographing section.

4,593,986

APPARATUS FOR DEVELOPING OR PEELING ALKALI-TYPE PHOTOSENSITIVE FILM

Yoshiaki Tomisawa, Hitachi; Seiji Kinoda, Fujisawa; Eiji Fujita, Hitachi; Masanori Murata, Hitachi; Toshio Takeuchi, Hitachi, and Ken Ogawa, Hitachi, all of Japan, assignors to Hitachi Chemical Co. Ltd., Tokyo, Japan

Division of Ser. No. 434,041, Oct. 13, 1982, Pat. No. 4,517,282.
This application Mar. 4, 1985, Ser. No. 707,499
Claims priority, application Japan, Oct. 14, 1981, 56-164764
Int. Cl.[4] G03D *5/04*
U.S. Cl. 354—324 **8 Claims**



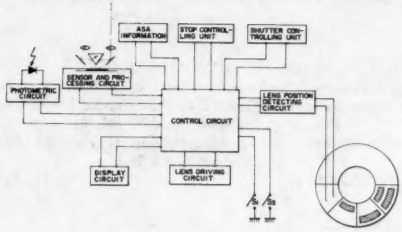
1. An apparatus for developing or imagewisely peeling an alkali-type photosensitive film, said apparatus comprising a developing or peeling device for contacting an alkali-type photosensitive film with a developing or peeling solution, thereby releasing a photosensitive film suspension; a solution tank for treating the developing or peeling solution containing the released photosensitive film suspension; conduit means for transporting the developing or peeling solution containing the released photosensitive film suspension from the developing or peeling device to the solution tank; a first reagent tank for storing a reagent for accelerating the deposition of the suspension of released photosensitive film; means for introducing a reagent from the first reagent tank into said solution tank; a second reagent tank for storing a reagent for depositing and floating the released photosensitive film suspension; at least one floating tank having means for separating a floating suspension from the developing or peeling solution; means for delivering the developing and peeling solution containing said released photosensitive film suspension and the reagent from the first reagent tank from said solution tank to said at least one floating tank; means for introducing a reagent from said second reagent tank into said at least one floating tank; and a blower for supplying a gas to the developing or peeling solution delivered from the solution tank to the at least one floating tank whereby the released photosensitive film suspension suspended in the developing or peeling solution delivered from the solution tank is flocculated with the reagents from the reagent tanks and the gas from the blower, the flocculated suspension in a floating state is removed from the floating tanks and the resulting developing or peeling solution free of the released photosensitive film suspension is available for recycle to the developing or peeling device.

4,593,987

METHOD AND DEVICE FOR AUTOMATIC EXPOSURE CONTROL BY PROGRAMS

Yoshiharu Takahashi, Hachioji, and Kijiro Suzuki, Hamura, both of Japan, assignors to Konishiroku Photo Industry Co., Inc., Tokyo, Japan

Continuation of Ser. No. 616,267, May 31, 1984, abandoned.
This application Oct. 3, 1985, Ser. No. 783,826
Claims priority, application Japan, Jun. 10, 1983, 58-104581
Int. Cl.[4] G03B *3/10*
U.S. Cl. 354—402 12 Claims



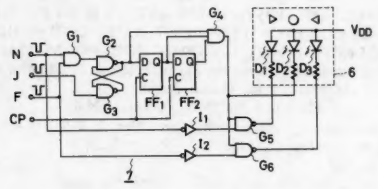
1. In a method of automatic exposure control of a camera having a lens, said lens being movable to focus on an object to be photographed, the improvement which comprises selectively controlling the exposure according to the distance of the object to be photographed from the lens by at least a first automatic exposure controlling program and a second automatic exposure controlling program, a maximum stop value permitted by the second program being smaller than a maximum stop value permitted by the first program, said second program controlling the exposure when an object is positioned near said lens, said first program controlling the exposure when said object is positioned far from said lens.

4,593,988

FOCUS CONDITION INDICATING DEVICE OF AN AUTO-FOCUS SYSTEM

Hideaki Akiyama, Tokyo; Susumu Iguchi, Yokohama, and Hirofumi Horigome, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 462,114
Claims priority, application Japan, Jan. 30, 1982, 57-13712; Feb. 5, 1982, 57-15027[U]
The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.
Int. Cl.[4] G03B *17/20*
U.S. Cl. 354—409 10 Claims



1. A device for indicating the current focus condition of an auto-focus system, said device comprising:

means for measuring a distance to an object of interest;

first processing means for processing the measured distance successively to determine the focus condition corresponding to the measured distance, said focus condition being either one of too close, in-focus and too far conditions;

storing means for storing a first predetermined number of the focus conditions successively determined by said first processing means;

second processing means for processing the thus stored first predetermined number of focus conditions to produce an in-focus indication signal only when said first predetermined number of focus conditions are found to include at least a second predetermined number of in-focus conditions; and

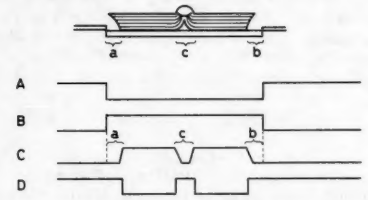
indicating means connected to said first and second processing means for indicating the current focusing condition, said indicating means indicating the in-focus condition in response to said in-focus indication signal supplied from said second processing means and the too close or too far condition in response to signals supplied from said first processing means.

4,593,989

CHARGE REMOVING DEVICE FOR AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Katsuyoshi Fujiwara, Osaka, and Hiroshi Uchiyama, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 1, 1984, Ser. No. 616,243
Claims priority, application Japan, Jun. 10, 1983, 58-104709
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R 4 Claims



1. A charge removing system for removing charges from a surface of a photoreceptor means to develop a latent image on said photoreceptor means in an electrophotographic copying machine comprising:

a light incident means for directing light beams toward said photoreceptor means, said light beams being reflected from a document to be copied including areas producing false images, such as document edges and a document gutter margin;

a charge removing means for removing unnecessary charges from said surface of said photoreceptor means, said unnecessary charges corresponding to said area of said document producing said false images; and

a control means for controlling the activation of said charge removing means said control means comprising a timer means for counting a time of moving said light incident means between a position of scanning the document and a position of scanning the false image producing areas, such as said document edges and document margin, and a lead switch means for sensing whether said document is being scanned or said false image producing areas including said margin is being scanned.

4,593,990

CONTROL DEVICE FOR CONTROLLING A DIAPHRAGM SLOT IN A MICROFILM-READING AND ENLARGING APPARATUS

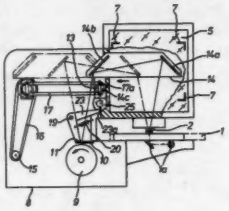
Josef Auer, Achstetten, and Hubert Hackenberg, Holzkirchen, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,424

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414278

Int. Cl.[4] G03B *13/28*

U.S. Cl. 355—45 16 Claims



1. A control device for controlling a slot in a diaphragm of a microfilm-reading-and-enlarging apparatus of the type including an illumination system, a projection lens having an optical axis, a movable carriage carrying thereon two mirrors facing each other and inclined at 45° relative to said optical axis, a diaphragm having a slot, and a copying cylinder rotatable synchronously with the movement of said carriage and wherein an enlarged microimage is projected in columns by said mirrors and through said slot onto said copying cylinder, the control device comprising means for adjusting said slot, said diaphragm including two flaps having edges forming said slot, at least one of said flaps being movable from a position closing said slot to a plurality of various open positions in which various widths of said slot are obtained, said adjusting means being operative for moving one of said flaps to each position, said adjusting means being coupled with said carriage.

4,593,991

COLOR IMAGE FORMING APPARATUS

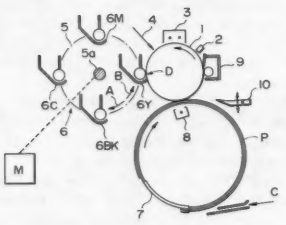
Takao Aoki, Abiko, and Keisaku Ushioda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,365

Claims priority, application Japan, May 30, 1984, 59-110066

Int. Cl.[4] G03G *15/06*

U.S. Cl. 355—14 D 5 Claims



1. A color image forming apparatus wherein electrostatic latent images corresponding to color components are formed on an image bearing member and developed to provide a color image, comprising:

a plurality of developing units each having a developing agent of a predetermined color;

means for revolvably supporting said plurality of the developing units;

driving means for driving said supporting means to move a desired one of said developing units to a developing station, said driving means being capable of revolving said supporting means in first and second directions wherein the second direction is opposite to the first direction; and

control means for selecting the direction of revolution of said supporting means when the desired one of said developing units is to be moved to the developing station.

4,593,992

IMAGE FORMING APPARATUS

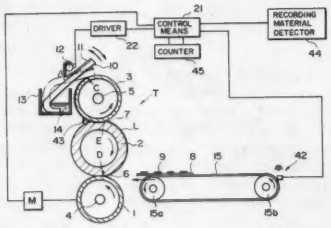
Kenji Yoshinaga, Yokohama, and Yusaku Takada, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,561

Claims priority, application Japan, Aug. 31, 1983, 58-159654

Int. Cl.[4] G03G *15/09*

U.S. Cl. 355—3 FU 23 Claims



1. An image forming apparatus having:

means for forming an unfixed image on a recording material;

fixing means having a pair of rotatable members for conveying said recording material while holding it between to fix said unfixed image on said recording material;

speed control means for variably controlling the rotational speed of said pair of rotatable members to a first fixing speed and a second fixing speed lower than said first fixing speed;

application means for intermittently supplying a parting agent to at least one of said pair of rotatable members; and

application control means for variably controlling the application acting period of said application means in accordance with the rotational speed of said pair of rotatable members variably set by said speed control means.

4,593,993

DEVICE FOR MOVING SEPARATING BELT INTO OR OUT OF CONTACT WITH PHOTOCONDUCTIVE DRUM IN ELECTROPHOTOGRAPHIC COPYING MACHINE

Masaru Imaizumi, Shinshiro, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 28, 1985, Ser. No. 706,607

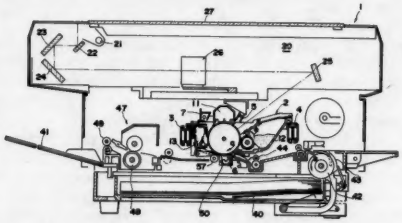
Claims priority, application Japan, Mar. 2, 1984, 59-40838

Int. Cl.[4] G03G *15/00*; B65H *29/54*

U.S. Cl. 355—3 R 5 Claims

1. In an electrophotographic copying machine wherein a photoconductive drum and at least one image forming element arranged around said drum are assembled into an unit which is removable from and installable into the main body of said machine axially of said drum, said machine having a separating belt being provided on the lower frame of the main body, and a device for moving said separating belt into or out of contact with said drum, said device comprising a lever member supporting said separating belt and permitting said separating belt to move into or out of contact with said drum, and a cam

member attached to said unit which engages with said lever member so as to move said separating belt out of contact with



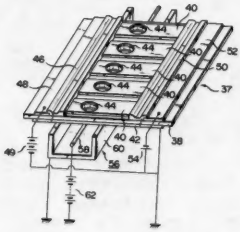
said drum in operative relation with the movement of said unit when said unit is withdrawn and installed.

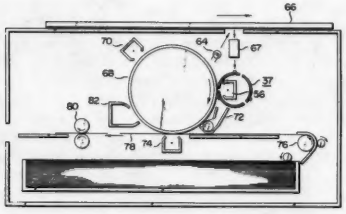
4,593,994

ION FLOW MODULATOR

Sakae Tamura, Chiba; Masahiro Hosoya, Yokohama; Takeshi Matsuo, and Tsutomu Uehara, both of Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 18, 1985, Ser. No. 712,646
Claims priority, application Japan, Mar. 30, 1984, 59-62702
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 SC **8 Claims**





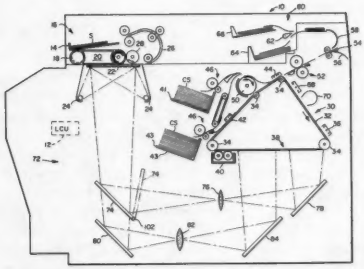
1. An ion flow modulator comprising:
an insulating substrate;
a common electrode formed on one major surface of said insulating substrate;
a plurality of ion flow control electrodes formed on the other major surface of said insulating substrate, each of said plurality of ion flow control electrodes being provided with one ion flow passage hole, said ion flow passage hole being formed through said insulating substrate and said common electrode;
means for generating ions passing through said ion flow passage hole;
a photoconductive layer formed on said insulating substrate and connected to one end of each of said plurality of ion flow control electrodes;
a first voltage application electrode formed on said insulating substrate and connected to said photoconductive layer;
a resistance layer formed on said insulating substrate and connected to the other end of each of said plurality of ion flow control electrodes so as to interpose said ion flow control electrodes between said resistance layer and said photoconductive layer;
a second voltage application electrode formed on said insulating substrate and connected to said resistance layer; and
a DC power source, connected to said common electrode, for applying voltages having different polarities to said first and second voltage application electrodes.

4,593,995

METHOD AND APPARATUS FOR PRODUCING MULTIPLE SETS OF COPIES OF A DOCUMENT

Ronald C. Holzhauser, Holley, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

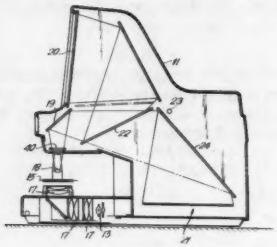
Filed Jun. 11, 1984, Ser. No. 619,245
Int. Cl.[4] G03G *15/04;* G03B *27/44*
U.S. Cl. 355—3 R **1 Claim**



1. In apparatus for producing sets of copies of a multi-page document comprising a plurality of sheets having pages to be copied arranged in a predetermined page sequential order, the apparatus including a photoconductor for receiving a latent image of a page of the document, means for developing such an image, means for transferring a developed image to a copy sheet, and means for fixinig the image on the copy sheet, the improvement comprising:
a recirculating feeder for presenting the pages of the document sheets seriatim a plurality of times at a position for copying;
means for reflecting light rays off of a page of the document at the copying position once each time the page is presented for copying;
an optical system comprising a beam splitter, a mirror and a pair of lenses, the beam splitter being located relative to the lenses and the mirror to (1) reflect some of the rays of light from a page at the copying position to a first one of the lenses and (2) transmit other rays of light from a page at the copying position to the mirror for reflection by such mirror to a second one of the lenses, the optical system being located with respect to the copying position and the photoconductor to form a plurality of duplicate latent images adjacent each other on the photoconductor each time a page of a document sheet is illuminated at the copying position so that the photoconductor receives a plurality of images of one page of the document followed by a plurality of images of another page of the document until all pages of the document are copied; and
means for collecting copy sheets containing images of pages of the document, the collecting means comprising a plurality of

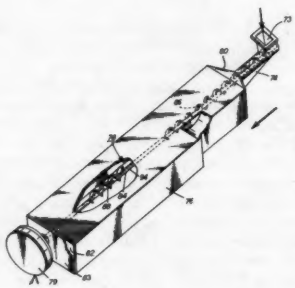
stations and means for directing copy sheets containing duplicate images to different stations.

4,593,996
READER-PRINTER
Shunji Kubono, Kanagawa, and Ushio Anayama, Ayase, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 29, 1984, Ser. No. 594,579
Claims priority, application Japan, Mar. 31, 1983, 58-45810 [U]; Aug. 23, 1983, 58-152561
Int. Cl.[4] G03G *15/00*; G03B *27/54*
U.S. Cl. 355—5 10 Claims



1. A reader-printer comprising: a lens provided on a main body for magnifying image information recorded on a recording medium, a projection screen provided on said main body for receiving said image information in enlarged size, an electrophotographic copier housed in said main body and having an exposure surface, means for focussing said enlarged image information on said exposure surface, a switching mirror provided on said main body for switching an optical path extending from said lens selectively to one of said projection screen and exposure surface, a mirror arranged within said main body and inclined toward said exposure surface, and an optical filter means interposed in said optical path for diminishing the quantity of light where the distance between the exposure surface and said mirror narrows.

4,593,997
RESIDUAL TONER REMOVAL AND COLLECTION APPARATUS
Wayne D. Fox, and Barry J. Gheer, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Jun. 22, 1984, Ser. No. 623,068
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—15 12 Claims



1. Apparatus for removing toner from a charge-retentive surface and collecting it for subsequent removal, said apparatus comprising:

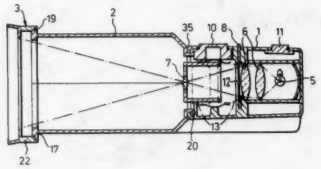
means for removing residual toner from said charge-retentive surface;

a receptacle for collecting said residual toner;

means for conveying said residual toner from where it is removed from said charge-retentive surface into said receptacle; said conveying means comprising conduit means and auger means disposed in at least a portion of said conduit means and in said receptacle; and

said auger means comprising at least two auger segments interconnected by a shaft and which are at least partially disposed in said receptacle and disposed substantially in a straight line with each other, said auger segments cooperating with each other to effect efficient packing of toner within said receptacle.

4,593,998
PHOTOGRAPHIC ENLARGER
Brian F. Moss, Chelford, and Richard J. Brent, Bramhall, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland
Filed Feb. 7, 1985, Ser. No. 699,389
Claims priority, application United Kingdom, Feb. 17, 1984, 8404231
Int. Cl.[4] G03B *27/52*, *13/24*, *13/26*
U.S. Cl. 355—21 5 Claims



1. A daylight enlarger of the enclosed image framing area type, comprising a lamp housing for receiving a lamp and lens means and having a location to receive a negative, transparency or the like to be enlarged, an enlarger tunnel body attached to the housing, a viewing area and an image framing area for receiving material on which an enlargement is to be printed; said enlarger tunnel body and the lamp housing being detachably connected to one another with the enlarger tunnel body being divided along its length into two parts which are connectable in a light-tight manner and which are detachable so that said body is capable of containing therein for storage purposes the lamp housing when the latter has been detached from the body; said viewing area being a viewing screen capable of being removably attached to the end of the tunnel body remote from that to which the lamp housing is attachable; and said image framing area being contained within an easel of the dark slide closable type also capable of being removably attached to said end of the tunnel body in place of the viewing screen.

4,593,999
COPYING APPARATUS
Hideki Adachi; Masahiro Tomosada, both of Kawasaki; Masayuki Hirose, Yokohama; Masanori Miyata, Mitaka, and Yutaka Komiya, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 27, 1983, Ser. No. 508,328
Claims priority, application Japan, Jul. 5, 1982, 57-115526; Aug. 23, 1982, 57-144759; Aug. 23, 1982, 57-144760
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—55 15 Claims

1. A copying apparatus comprising:

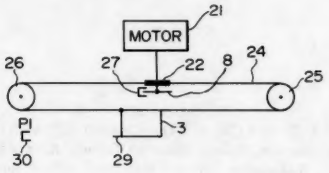
an optical lens adapted to form images of varying magnification;

detector means for detecting the reference position of said optical lens;

drive means for driving said optical lens; and

control means for controlling said drive means;

wherein said control means is adapted to drive said optical lens in each of first and second speed modes, said optical lens being driven at higher speed in said first speed mode than that in said second speed mode, wherein said control means is adapted to move said optical lens to a position corresponding to a desired magnification factor after

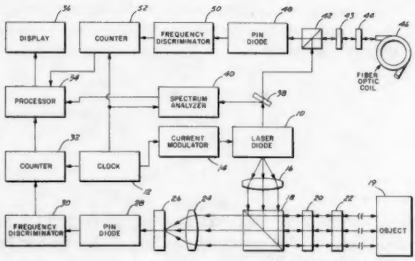


completion of movement of said optical lens to said reference position by utilizing said first speed mode, and wherein, upon movement of said optical lens from said reference position to the position corresponding to said desired magnification, said control means utilizes said first and second speed modes if the movement distance of said optical lens is more than a predetermined distance and said control means utilizes only said second speed mode if the movement distance of said optical lens is less than the predetermined distance.

4,594,000
METHOD AND APPARATUS FOR OPTICALLY MEASURING DISTANCE AND VELOCITY

Robert A. Falk, Louisville, and Gary L. Phillis, Boulder, both of Colo., assignors to Ball Corporation, Broomfield, Colo.

Filed Apr. 4, 1983, Ser. No. 481,987
Int. Cl.[4] G01C *3/08;* G01P *3/36*
U.S. Cl. 356—5 **14 Claims**



13. A method for use in optically making measurements relating to an object, comprising the steps of:

simultaneously emitting identical first and second modulated optical radiation signals;

determining a first frequency difference that arises when said first optical radiation signal travels to and from said object;

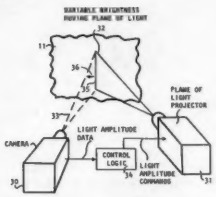
determining a second frequency difference that arises when said second optical radiation signal travels a known distance; and

employing said first and second frequency differences and said known distance to determine the distance of said object.

4,594,001
DETECTION OF THREE-DIMENSIONAL INFORMATION WITH A PROJECTED PLANE OF LIGHT

Paul DiMatteo, Huntington; Joseph Ross, Fort Solanga, and Richard Schmidt, Huntington, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 281,068, Jul. 7, 1981, Pat. No. 4,494,874. This application Oct. 6, 1983, Ser. No. 539,615
The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.
Int. Cl.[4] G01B *11/24*
U.S. Cl. 356—376 **11 Claims**

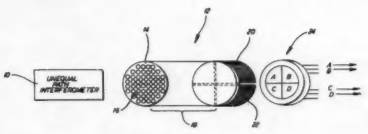


1. A method of detecting three-dimensional information, comprising the steps of: projecting a variable-intensity plane of light onto an object to be scanned; effecting a first scan by causing relative movement between said object and said plane of light; receiving light-intensity signals from said object from said plane of light; applying a second scan by causing relative movement between said object and said plane of light; and modifying the light-plane intensity during the second scan; increasing the light-plane intensity during the second scan at such points where the signal was weak during the first scan; and reducing the light-plane intensity during the second scan at such points where the signal was strong during the first scan.

4,594,002
APPARATUS FOR ANALYZING COHERENT RADIATION

Mark J. McNally, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 5, 1984, Ser. No. 628,098
Int. Cl.[4] G01J *9/02*
U.S. Cl. 356—346 **12 Claims**



1. In apparatus for analyzing coherent radiation in the presence of non-coherent ambient radiation subject to atmospheric scintillation effects, using unequal path interferometer means and detector means, the improvement comprising:

a closely packed bundle of fiber optic elements having an input face disposed adjacent said interferometer means for receiving incident radiation passing therethrough, each of said elements being of a substantially smaller diameter than the atmospheric scintillation spatial structure;

said bundle of fiber optic elements having a medial portion wherein said elements are arranged in a plurality of subbundles;

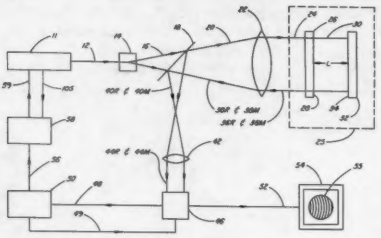
said detector means having a plurality of detector elements, each detector element being mounted adjacent one of said bundles for being illuminated thereby.

4,594,003

INTERFEROMETRIC WAVEFRONT MEASUREMENT

Gary E. Sommargren, Madison, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Jul. 20, 1983, Ser. No. 515,393
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—349 19 Claims



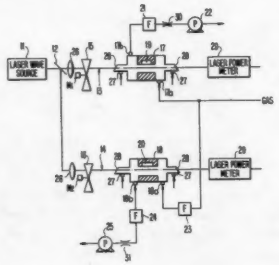
1. An interferometer system comprising a source of a beam of coherent signal wavelength energy, comprising a laser; an unequal path optical interferometer means disposed for converting said beam into an interference pattern produced between a reference wavefront and a measurement wavefront; means for varying the wavelength of said source monotonically to provide phase modulation of said interference pattern; means for determining magnitude of the wavelength variation of said source required to provide at least one full cycle of said phase modulation of said interference pattern; and means for photosensing the radiant energy of said interference pattern over an array of points over a time period of at least one full cycle of said phase modulation, said wavelength varying means monotonically varying said wavelength over the time required for said photosensing of said interference pattern.

4,594,004

CONTINUOUS PARTICULATE-MEASURING APPARATUS USING AN OPTOACOUSTIC EFFECT

Kozo Ishida; Junji Okayama, and Kunio Otsuki, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Jun. 28, 1983, Ser. No. 509,229
Claims priority, application Japan, Jul. 3, 1982, 57-116444
Int. Cl.[4] G01N *21/61*
U.S. Cl. 356—433 3 Claims



1. An apparatus for continuously measuring the concentration of particulates in a sample gas by using an optoacoustic effect, comprising:

means for directing identical laser rays along two optical paths;

a chopper and an optoaboustic cell positioned in the recited order in each of said optical paths downstream of said means;

a gas introducing means for introducing sample gas containing particulates into one optoacoustic cell and for introducing the sample gas from which the particulates have been removed into the other optoacoustic cell; and

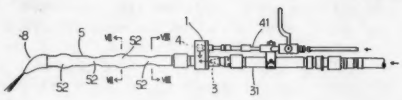
chopper drive means connected to said choppers for driving the respective choppers for producing a chopping action on the respective laser rays at a frequency corresponding to the resonant frequency of the corresponding optoacoustic cells, whereby the outputs from the cells can be compared for providing an indication of the concentration of the particulates in the sample gas.

4,594,005

FLUID MIXING METHOD AND APPARATUS

Osamu Sakamoto, Tokyo; Yasuhiko Tsuruta, Kamakura; Haruo Sasaki, Yokohama; Yasuo Tsukamoto, Tokyo, and Kiyoshi Kudo, Yokohama, all of Japan, assignors to Taisei Corporation, Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,171
Claims priority, application Japan, Jun. 15, 1983, 58-105727
Int. Cl.[4] B01F *15/02, 15/08*
U.S. Cl. 366—177 11 Claims



1. A method of mixing fluid and/or granular compositions, comprising the following steps:

introducing at least two substances, which are capable of being poured, in at least two planar non-parallel directions relative to each other, into a nozzle, said at least two substances being introduced in belt-shaped streams and undergoing initial mutual dispersion in said nozzle; and

subsequently passing said at least two substances to a mixing tube having a varying internal cross-section along its length, whereby further mixture of said at least two substances is achieved.

4,594,006

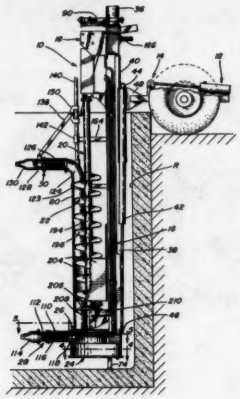
APPARATUS FOR MIXING AND PUMPING SLURRY

Marcel Depeault, 1337 rue Principale, St-Valérien, Co Shefford, Québec, Canada (J0H 2B0)

Filed Jan. 17, 1984, Ser. No. 571,672
Int. Cl.[4] B01F *5/12*
U.S. Cl. 366—266 16 Claims

1. An apparatus for mixing and pumping a slurry from a reservoir including an elongated frame adapted to be placed vertically in the reservoir, a first pump means having an inlet at the bottom of said frame adapted to be near the bottom of the reservoir and the first pump means having a discharge, and slurry conduit means communicating with the discharge of said first pump means and extending upwardly on the frame for communication with one of a delivery means and a first nozzle type agitator, an elongated pump screw provided on the frame and driven to provide a vertical thrust to the slurry in the vicinity of the frame in a direction to move the slurry being

mixed from an upper region of the reservoir relative to the frame towards a lower region of the reservoir relative to the



frame, and means for driving the first pump means and the elongated pump screw.

4,594,007

TIME-PROGRAMMING APPARATUS

Winfried Brandenberg, Freienohl, Fed. Rep. of Germany, assignor to Westdeutsche Elektrogeratebau GmbH, Soest, Fed. Rep. of Germany

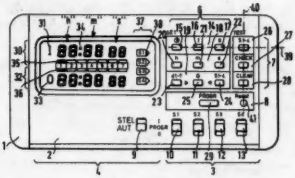
PCT No. PCT/EP83/00107, § 371 Date Dec. 20, 1983, § 102(e) Date Dec. 20, 1983, PCT Pub. No. WO83/03688, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 18, 1983, Ser. No. 571,550

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214372

Int. Cl.[4] G04B *47/00*; G08B *1/00*

U.S. Cl. 368—10 **27 Claims**



1. An electronic time programming apparatus comprising:

a central processor including:

at least one recording/readout working memory having addressable registers,

computing means including at least one logic circuit connected to said recording/working memory for processing output signals therefrom, and

at least one program memory with an associated program counter connected to said logic circuit for the generation and distribution of function signals for said central processor;

a luminous digital display connected to said central processor and divided into subregions with respective display fields for alphanumeric display;

input means including manually actuatable keys and respective switches operated by said keys and assigned to the respective display fields and arranged in groups in respective subregions, said input means being connected to said central processor;

output means connected to said central processor and having a plurality of load circuits with respective channels for the selective actuation of a respective load to be operated by said apparatus;

a common housing for said central processor, said display, said input means and said output means and having a wall provided with said display; and

power means in said housing for supplying electrical power to said central processor, said input means being so connected to said central processor to define hierarchical functioning and including:

(a_1) first function selection switch means forming part of said input means and having keys for selecting between ON and OFF of respective ones of said channels for respective ones of said load circuits of said output means and between automatic (AUT) and control (STEL) modes in which, respectively, the automatic operation of the selected channels and the setting of inputs for said channels can be effected,

(a_2) second function selection switch means forming part of said input means and having keys for enabling said input means to key into said central processor an actual time of day (UHR) setting, a switch-ON time setting (EIN) for switching on a selected channel, a switch-OFF time setting (AUS) for switching off a respective channel, and an automatic operation setting (AUT) to enable said settings to be changed only upon both the initial operation of said first function selection means and keys for said settings of said second function selection means, and

(a_3) further selection means including single keys each for the selection of days of the week, hour (h) and minute (m) to form the respective time settings, switch-ON and switch-OFF time input keys for registering the respective time settings and for assignment thereof to respective switching channels to input the registered time setting for the respective channels in said central processor only upon actuation of corresponding keys of said first and second function selection means and of further selection means, each of said keys of said further selection means incrementing the respective setting while it is depressed, said input means and said central processor being constructed and arranged so that signal groups for said switching ON and switching OFF times and an associated channel are transferred from intermediate memories to said central processor in totality as data packages, each data package being applicable to corresponding inputs and outputs of said program and working memories by said computer means.

4,594,008

WATERTIGHT CASE FOR WATCHES

Walter Affolter, Zurich, Switzerland, assignor to Mondaine Watch Ltd., Switzerland

Filed Jan. 18, 1985, Ser. No. 692,636

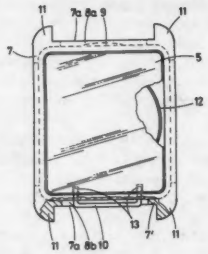
Claims priority, application Switzerland, Jan. 23, 1984, 281/84

Int. Cl.[4] G04B *37/00*

U.S. Cl. 368—276 **7 Claims**

1. A watertight case for a watch comprising a middle, a crystal bezel and a gasket clamped between the crystal and the upper edge of said middle of the case, wherein said crystal bezel comprises on each opposed strap fixing side a depending wall encompassing said middle, in which a recess is formed, the peripheral wall of said middle further comprising on one of the strap fixing sides a projection formed integrally with said peripheral wall limited by a bearing face extending substantially at right angles and radially from said wall and adapted in the assembled condition to engage said recess formed in said depending wall of said bezel, whereby said bearing face, responsive to the resilient pressure of said gasket, is pressed against the lower limiting surface of said recess the opposite strap fixing side being provided with a locking member adapted releasably to engage the peripheral wall of said middle

and to be received and locked in the other recess of the wall of said crystal bezel due to the resilient action exerted by the



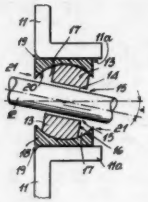
compressed gasket against the lower limit wall of said other recess, thus firmly holding in position the crystal bezel by pressing said bezel against said middle.

4,594,009

CASING FOR POROUS SELF-ALIGNING BUSHINGS, AND A BEARING INCLUDING THE BUSHED CASING

Giorgio Gutris, Premia' De Mar, Spain, assignor to European Electric Motors Design and Engineering Anstalt, Vaduz, Liechtenstein

Filed Jul. 13, 1983, Ser. No. 513,274
Claims priority, application Italy, Nov. 17, 1982, 24280 A/82
Int. Cl.[4] F16C *23/04, 27/06, 33/10, 35/00*
U.S. Cl. 384—203 **3 Claims**



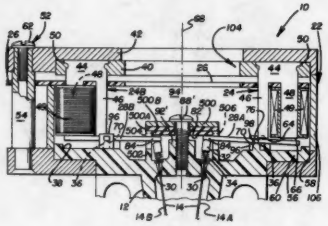
1. A rotary machine comprising:
a shaft having a vertical axis;
a porous bushing containing a lubricant and having an inner surface surrounding said shaft and an outer surface;
a hub having an inner surface;
a casing mounting said bushing within said hub, said casing consisting of a single integral annular solid body formed of an elastomeric material, said solid body having an annular outer surface interference fit with said inner surface of said hub and an annular inner surface mating with and complementary to said outer surface of said bushing;
said solid body having at a lower axial end thereof an integral annular extension extending axially beyond said bushing and radially inwardly toward said shaft, said integral extension having an inner surface spaced axially from an adjacent axial end face of said bushing, said integral extension having therein a coaxially central opening receiving therethrough said shaft, said central opening being defined by a vertical wall extending upwardly and ending in a lip contacting said shaft; and
said lip and said inner surface of said extension defining therein an annular chamber for retaining and/or collecting lubricant discharged downwardly from said bushing or flowing by gravity along said vertical shaft, and said lip preventing the entrance into said chamber of dust or moisture.

4,594,010

WIRE MATRIX PRINT HEAD

Alex Jachno, Nyack, N.Y., assignor to Bsr, Ltd., Santa Clara, Calif.

Filed Apr. 23, 1984, Ser. No. 603,232
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **14 Claims**

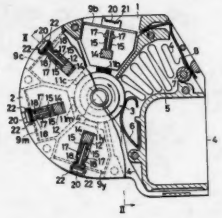


1. In a wire matrix print head with an array of operating components circumferentially arranged about a central axis including
a plurality of print wires arranged for longitudinal movement between a print position and a non-print position,
guide means for supporting the print wires in their print and non-print positions,
means for urging the print wires toward their non-print positions,
a radially arranged array of rigid armatures associated with the respective print wires, an end portion of each armature being arranged for engagement with the respective print wire for driving it toward its print position,
a circumferential array of separate electromagnetic means associated with the respective armatures, the electromagnetic means being operable for causing movement of the end portion of the respective armature so as to cause said armature to drive the respective print wire toward its print position, and
housing means for supporting the print wires, armatures and electromagnetic means in operating relatinship,
the improvement comprising
means for supporting each of the electromagnetic means opposite the respective armatures from the print wires, each electromagnetic means forming a planar surface perpendicular to said central axis, the inner edge of said planar surface closest to said central axis formed for engagement with the respective armature, and
a rigid pivot element arranged opposite each of the armature from said edge of the respective electromagnetic means, each said pivot element having an apex lying in a plane which is perpendicular to said central axis and arranged for engagement with the respective armature in radially spaced apart relation from said edge, said rigid pivot element and said edge being axially spaced apart from each other a predetermined fixed distance to enable pivoting movement of the respective armature therebetween to cause said armature to be in contact with the apex of said pivot element and abutting said planar surface when said electromagnetic means has caused said armature to drive the respective print wire into its said print position.

4,594,011
INK CARTRIDGE CHANGEOVER DEVICE IN AN INK RIBBON CASSETTE FOR A PRINTER

Mikio Hayashi, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,730
Claims priority, application Japan, Dec. 17, 1982, 57-191018
Int. Cl.[4] B41J *31/16, 32/02*
U.S. Cl. 400—200 **4 Claims**



1. An ink ribbon cassette comprising: a casing having top and bottom walls, a rotatable transfer roller in said casing, an ink cartridge slidably mounted in said casing and movable between an inner position contacting said transfer roller and a retracted position spaced from said transfer roller, a spring urging said ink cartridge toward said inner position, said top wall having a slot extending radially outwardly relative to said transfer roller, means attached to said ink cartridge for moving said cartridge by hand outwardly from said inner position to said retracted position, and a pair of spaced outwardly extending elastic levers attached to said ink cartridge to undergo back and forth movement lengthwise in the top wall slot as said ink cartridge moves back anh forth between its inner and retracted positions each said lever having an external projection extending transversely of the top wall slot and said levers being elastically flexible from their normal unflexed positions toward each other and toward said bottom wall, said top wall slot having on opposite sides thereof a pair of confronting projections effective to elastically flex said levers toward each other during movement of said ink cartridge to said retracted position to thus allow said external projections to slide past said confronting projections and thereafter to return to their normal positions to engage said confronting projections to thereby maintain said ink cartridge in said retracted position, and means for elastically flexing said levers toward said bottom wall to disengage said external projections of said lever from said confronting projections of said slot to thereby permit said spring to slide said ink cartridge to said inner position.

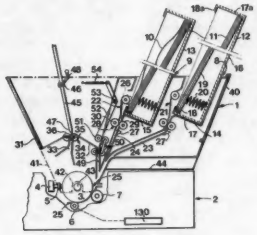
4,594,012
Patent Not Issued For This Number

4,594,013
SHEET FEED DEVICE FOR A PRINTER OR TYPEWRITER

Jorge Costa, and Wolfgang Reichel, both of Yverdon, Switzerland, assignors to Hermes Precisa International S.A., Yverdon, Switzerland

Filed Jun. 1, 1984, Ser. No. 616,146
Claims priority, application Switzerland, Jun. 3, 1983, 3059/83
Int. Cl.[4] B41J *11/58, 13/10*
U.S. Cl. 400—625 **6 Claims**

1. A sheet feed device for a printer or typewriter having a driven platen and a carriage on which a writing device is mounted, comprising a frame having a plurality of supports adapted to support a stack of sheets to be printed, a sheet removal mechanism associated with each of said supports for removing a sheet from the stack for its introduction into the printer, drive means operatively connected between the printer platen and the sheet removal mechanism, and a selection mechanism operatively connected to said carriage for

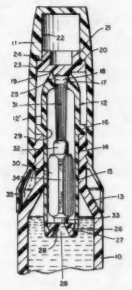


selectively actuating one of said sheet removal mechanisms; said selection mechanism comprising a drive member connected to said carriage, and lever means operatively connected to each sheet removal mechanism, whereby the drive member engages a selected lever means depending upon the position of the carriage to thereby actuate a selected sheet removal mechanism for removing a sheet from the respective stack.

4,594,014
FOUNTAIN BRUSH

George W. Korper, Dickerson, Md., assignor to Wite-Out Products, Inc., Beltsville, Md.

Filed May 10, 1985, Ser. No. 732,597
Int. Cl.[4] A46B *11/00*
U.S. Cl. 401—115 **1 Claim**



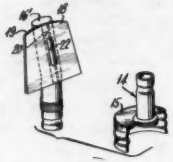
1. A fountain brush comprising a liquid reservoir member serving as a handle for the brush and having a threaded neck, a valve body extending through the neck and into the interior of the liquid reservoir member and also extending outwardly from the neck, a shoulder element on the valve body abutting the end face of the neck to position the valve body on the reservoir member, the inner end of the valve body having a constricted opening, a plug having snap-locked engagement in the restricted opening and having an interior flat end face defining a valve seat and having a central outwardly flared opening forming the inlet of the valve body for liquid contained in the reservoir member, the other end of the valve body having a central cylindrical liquid outlet opening including an outer conically flared portion surrounded by a thin annular lip which defines the outer end of the valve body, the cylindrical outlet opening at its inner end defining a second valve seat on the valve body, a polygonal cross-section gravity-operated

applicator brush holder movably held in the interior of the valve body between said valve seats and being captively held therein, a pair of valve elements on opposite ends of the applicator brush holder and each being adapted to engage one of said valve seats in one shifted position of the brush holder within the valve body, said valve elements closing said liquid inlet and outlet openings when engaging said seats, an applicator brush fixed to one valve element of the brush holder and extending axially therefrom and being engaged within the liquid outlet opening of the valve body in all positions of the applicator brush holder, a closure cap for the reservoir member having threaded engagement with said neck and including an interior seal fixed therein between the ends of the closure cap, and said seal including a central tapered projection coaxially aligned with the liquid outlet opening and said thin annular lip and being adapted to engage snugly and sealingly within said lip when the closure cap is fully applied to the neck of the reservoir member.

4,594,015
PAINT APPLICATOR

Francis J. Pomares, 124 Russell St., White Plains, N.Y. 10606

Filed Jun. 8, 1984, Ser. No. 618,682
Int. Cl.[4] A46B *11/00, 11/02*
U.S. Cl. 401—266 **4 Claims**



1. A paint applicator comprising paint supply means including a tubular paint supply conduit, a paint distributing head angularly affixed to one end of said conduit, said paint distributing head including a metal plate affixed to said conduit, said plate having an opening communicating with said conduit and a convex top or outer edge portion, a layer of sponge-like material affixed to said metal plate and extending from at least the top and side edges thereof, with the top edge having a convex configuration, said material having a central opening extending therethrough and aligned with the first said opening, a paint applicating layer adhesively secured to the surface of said sponge-like material and a sealing material coating the exposed portions of the sponge-like material to restrict the flow of paint to the sponge-like material and said paint applicating layer and a layer of aint impervious material adhered to the convex outer surface of said sponge-like layer of material and at least part of said paint applicating layer, the outer surface of the last said material being smooth and having a low coefficient of friction.

4,594,016
FLIP CARD FILE HOLDER

Calvin G. Husbands, 7237 SW. Canyon Dr., Portland, Oreg. 97225

Filed Feb. 13, 1984, Ser. No. 579,526
Int. Cl.[4] B42F *17/00, 17/08, 13/02*
U.S. Cl. 402—75 **3 Claims**

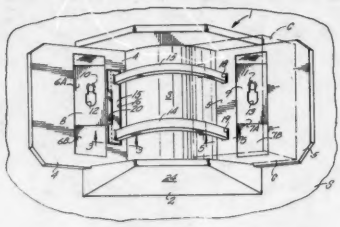
1. A card file holder comprising in combination,

a base including a card supporting extension defining an elongate opening,

an arm assembly including a pair of flexible parallel arms, a bridge integral with corresponding ends of the arms, said arms adapted at their corresponding distal ends for inserted engagement with said base,

arm assembly mounting means including a shoulder on said base and disposed in the extension defined opening and having converging surfaces, and

said arm assembly bridge having inclined surfaces spaced apart from one another along the bridge for surfacial engagement with the converging surfaces of the shoulder

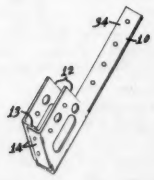


whereby the arm assembly bridge may be rotated out of engagement with the base by a lifting motion manually imparted to the distal ends of said arms.

4,594,017
JOIST HANGER AND BLANK THEREFOR

Robert A. Hills, Jacksonville, Fla., assignor to Altech Industries, Inc., Jacksonville, Fla.

Filed Jun. 17, 1985, Ser. No. 745,532
Int. Cl.[4] B25G *3/00;* **F16D** *1/00*
U.S. Cl. 403—6 **21 Claims**



1. A joist hanger for connecting a wooden joist to a wooden header, said joist hanger comprising:

(a) a stirrup seat member having two parallel sidewalls and a bottom wall extending outwardly at right angles from a hanger strap adapted to lie against the face of said header;

(b) said bottom wall including flanges of each said sidewall bent toward each other and partially overlapped to form a double thickness over a portion of the distance between said sidewalls;

(c) an elongated hanger strap extending from said bottom wall to a substantial distance above the tops of said sidewalls and adapted to be bent to match the outside contour of said header;

(d) a keyhole passageway through said hanger strap adjacent said sidewalls having a large opening adapted to permit passage of a nail head therethrough and a small opening adapted to permit passage of a nail shank but not a nail head therethrough.

(e) a plurality of spaced holes through said sidewalls said bottom wall and said hanger strap to permit passage of a nail shank but not of a nail head therethrough, and

(f) an elongated finger access passageway through each said sidewall adjacent said hanger strap adapted to permit fingers to extend therethrough to hold a nail to be driven through said hanger strap into said header.

4,594,018

TURNBUCKLE

Göran Larsson, Hisings Kärra, and Peter Sundman, Onsala, both of Sweden, assignors to Riggarna Sundman, Larsson & Josefsson AB, Vastra Frolunda, Sweden

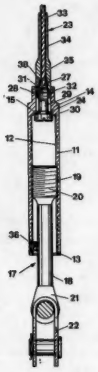
PCT No. PCT/SE83/00431, § 371 Date Aug. 6, 1984, § 102(e) Date Aug. 6, 1984, PCT Pub. No. WO84/02381, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 7, 1983, Ser. No. 638,966

Claims priority, application Sweden, Dec. 7, 1982, 8206967

Int. Cl.[4] F16G *11/12*

U.S. Cl. 403—43 **7 Claims**



1. A turnbuckle comprising an internally threaded sleeve, a first fixing member having an externally threaded end portion threaded into the sleeve from one end of the sleeve with the first fixing member extending from said one end of the sleeve, an internal shoulder defining an internal seat at the other end of the sleeve, and a second fixing member comprising a shank with an internally threaded end portion, a screw threaded into said end portion, and transverse pin means connected between the end portion and the screw for fixing the screw to the shank, the screw having a screw head trapped internally of the sleeve by said seat with the shank extending outwardly from said other end of the sleeve, and said second fixing member being free to rotate in said sleeve with said seat forming a bearing surface for the screw head.

4,594,019

DEVICE FOR CONNECTING AN UPRIGHT AND A HORIZONTAL MEMBER IN A TUBULAR METAL SCAFFOLD FOR A BUILDING

Guglielmo Maleci, and Tullio Latini, both of Milan, Italy, assignors to FAP Praticus S.p.A., Graffignana Lodigiana, Italy

Filed Dec. 18, 1984, Ser. No. 683,190

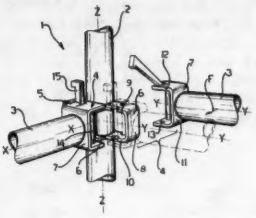
Claims priority, application Italy, Dec. 19, 1983, 24238 A/83

Int. Cl.[4] F16B *7/00*

U.S. Cl. 403—246 **2 Claims**

1. A device for connecting an upright and a horizontal member in a tubular metal scaffold for building, comprising:

a forked joint including a tenon fixed to the upright and a fork fixed to the horizontal member, which tenon and fork engage each other to define a male and female coupling when interengaged, and



a pin and a wedge which are essentially parallel with each other and extend through the fork and tenon to lock the fork on the tenon.

4,594,020

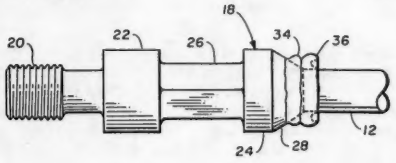
WELDED OIL WELL PUMP ROD

Rodney F. Hughes, Dallas, Tex., assignor to Mega Industrial Products, Inc., Dallas, Tex.

Division of Ser. No. 407,807, Aug. 13, 1982, abandoned. This application May 4, 1984, Ser. No. 607,279

Int. Cl.[4] B25G *3/00*; F16B *7/18*

U.S. Cl. 403—343 **3 Claims**

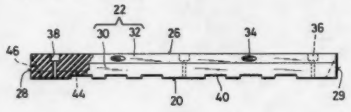


1. A friction welded multiple component oil well sucker rod comprising an elongated cylindrical rod section and apposed coupling end portions welded to opposite ends of said rod section, said coupling end portions being of a nominal maximum diameter at least 1.5 times greater than said rod section and including means for connecting said sucker rod to an adjacent rod in end to end relationship, said couplings end portions each including an axial tapered portion between said connecting means and an end face adapted to be butted to said rod section, said coupling end portions being butted against said opposed end portions of said rod section during a friction welding operation to form a radially outward projecting bulge of displaced material on said rod section and said coupling end portions, respectively, whereby a greater cross-sectional area is formed at the transition of said rod section to said coupling end portion to reduce the unit tensile stress on said sucker rod in the vicinity of the weld, wherein said displaced material is machined to form a tapered surface between said rod section and said axial tapered portion of said coupling end portion, said tapered surface having an angle of taper with respect to the longitudinal axis of said sucker rod less than the angle of taper of said coupling end portion.

4,594,021
MARKER BLOCK FOR DIVISIONS ON TRAFFICWAYS IN FORM OF AN OBLONG BEAM-LIKE BODY AND HAVING REFLECTIVE MEANS

Hartmut Schäfer, Oberbuschweg, 5000 Cologne 50, and Franz Linder, Waldorferstrasse 7, 5000 Cologne 51, both of Fed. Rep. of Germany (D-5000)

Filed Apr. 23, 1984, Ser. No. 603,130
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—14 17 Claims



1. A solid and resilient marker block over which other vehicles can pass for divisions on highways comprising:

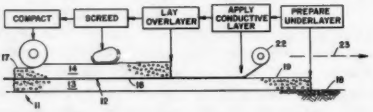
an oblong beam-like body having a substantial and constant cross-section over its length, said marker block having a bottom fixation surface, two lateral faces, an upper face and two end faces;

said marker block being made of an elastic material consisting of solidly-molded linear recycled rubber pieces and a binder, and having a longitudinal reinforcmeent member embedded therein, the body having reflective means on at least one of the faces, the lateral faces having recesses for receiving said reflective means, the upper faces recesses and through-holes having enlargements to the bottom for receiving screws for point by point fixation of said block to an underlying surface, Said surface marker being flexible and capable of being curved in its longitudinal direction so as to be adapted to conform to a curvature of the highway and to conform to different levels of the highway, said marker being of a height over which vehicles can pass.

4,594,022
PAVING METHOD AND PAVEMENT CONSTRUCTION FOR CONCENTRATING MICROWAVE HEATING WITHIN PAVEMENT MATERIAL

Morris R. Jeppson, Carmel, Calif., assignor to MP Materials Corporation, Carmel, Calif.

Filed May 23, 1984, Ser. No. 613,518
Int. Cl.[4] E01C *3/00, 7/06*
U.S. Cl. 404—28 23 Claims



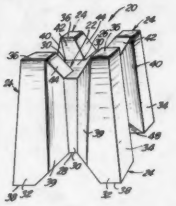
1. In a pavement which extends along a surface of the ground to form a roadway or the like thereon wherein at least an upper layer of the pavement that extends along said ground surface is formed of microwave absorbent thermoplastic paving material and wherein the material below said upper layer is also of a type into which microwave energy can pentrate, the upper layer having a thickness that is smaller than the maximum distance that microwave energy can penetrate into said paving materials, the improvement comprising:

a microwave energy reflective zone located between said upper layer and said lower material, said zone being defined by a relatively thin expanse of electrically conductive material between said upper layer and lower material and which has a configuration that will reflect at least a portion of downwardly propagating microwave energy back up into said upper layer.

4,594,023
BREAKWATER CONSTRUCTION ELEMENT

Raymond J. O'Neill, 3 Garmony Pl., Yonkers, N.Y. 10710

Filed Oct. 11, 1984, Ser. No. 659,676
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—29 7 Claims



1. A breakwater construction element comprising:

(a) an inner core, said core being in the shape of a prismatic solid having an upper surface, a lower surface and four sides, the cross section of said core in a vertical plane being trapezoidal with the longer base disposed at the lower surface;

(b) leg means extending from the corners of said inner core, said leg means extending above the upper surface, below the lower surface and beyond the periphery of said core to thereby space said core apart from any surface on which it rests regardless of which surface of the core is disposed downwardly;

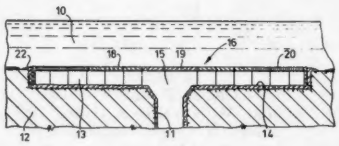
(c) said leg means being trapezoidal in vertical cross section with the longer base of the trapezoid disposed downwardly; and

(d) said inner core and said leg means forming a construction element that is trapezoidal in overall configuration.

4,594,024
OFFSHORE INTAKE STRUCTURE

Wolfgang R. Jenkner, 2139 Varency Drive, Mississauga, Ontario, Canada (L5K 1C2); Alan E. Christie, 37 Quincy Cresent, Willowdale, Ontario, Canada (M2J 1C5); Emad E. M. Elsayed, 4 Fassett Avenue, Hamilton, Ontario, Canada (L9C 4E7); John S. Griffiths, 28 South Kingslea Drive, Etobicoke, Ontario, Canada (M8Y 2A4), and Guney A. Mentes, 135 Silas Hill Drive, Willowdale, Ontario, Canada (M2J 2X8)

Filed Apr. 10, 1984, Ser. No. 598,707
Int. Cl.[4] E02B *5/08, 9/04*
U.S. Cl. 405—127 9 Claims



1. An offshore intake structure for a once-through water cooling system supplied from a reservoir and having an intake shaft communicating with the reservoir, comprising:

means defining a well excavated in the bed of the reservoir, the well having a substantially flat bottom with an outlet opening communicating with said intake shaft and being bounded by a peripheral wall,

means defining a horizontal submarine roof structure extending over the entire area of the well, the roof structure being bounded by said peripheral wall, and

means supporting the roof structure from the bottom of the well in spaced relationship thereto, thereby defining a well chamber,

the roof structure having a horizontally extending perforate peripheral region defining an inlet to the well chamber through which water flows downwardly from the reservoir into the well chamber, and a horizontally extending imperforate central region encircled by said peripheral region, the central region of the roof structure extending over the outlet opening and radially outwards therefrom so as to define with the well bottom a horizontal radially converging flow passage extending from said well chamber inlet to the intake pipe.

4,594,025

TUNNELLING AND TUNNEL RELINING EQUIPMENT

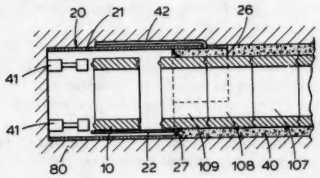
Terence V. Manlow, Camberley, England, assignor to Rees Construction Services Limited, Old Woking, England

Filed Jun. 25, 1984, Ser. No. 623,985

Claims priority, application United Kingdom, Jun. 27, 1983, 8317347

Int. Cl.[4] E01G *5/04;* E21D *11/00*

U.S. Cl. 405—147 **12 Claims**



1. A method of constructing a lined or relined tunnel utilising four lining segments, three of said segments having a greater arcuate length than the fourth, and a shield comprising a tubular member, an integral bottom, curved build plate located inside the forward end of said tubular member, the build plate having a minimum internal dimension at least the same as the outside radius of the lining, a substantially circular skirt projecting from a rear end of said tubular member and having substantially the same diameter as said tubular member, said skirt having a rearwardly extended hood disposed about an arc encompassing the upper curved part of the tubular member and a radially inwardly directed collar for sealing by engaging with the outer periphery of the erected lining, including the steps of:

(a) providing a length of a tunnel within said shield which shield is arranged to have an internal diameter greater than the outside diameter of the erected lining,

(b) positioning a first segment of long length on the build plate,

(c) engaging one end of a second segment of long length to one end of the first segment,

(d) engaging one end of a third segment of long length to the other end of the first segment,

(e) raising the other ends of the second and third segments by pivoting the one ends thereof so as to locate therebetween the fourth segment, whereby a toroid is formed,

(f) urging the thus formed toroid rearwardly to join with the previously erected lining,

(g) advancing the shield such that a major length of the newly formed toroid is below said hood,

(h) filling the space rearward of a collar of the skirt between the lining and the shield or excavated tunnel under pressure with filler material,

(i) advancing the shield and repeating the steps of a–h.

4,594,026

WEDGE MEMBER FOR ASSEMBLING TUNNEL SHIELD VOUSSOIRS

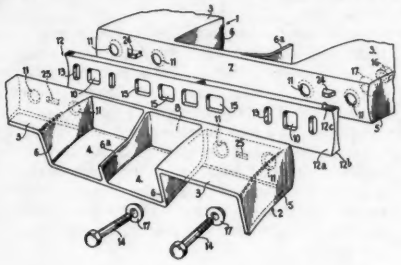
Jean-Claude Hauer, Saulxures Les Nancy, and Jacques Oger, Pont-A-Mousson, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed May 25, 1984, Ser. No. 613,983

Claims priority, application France, May 27, 1983, 83 08860

Int. Cl.[4] E21D *11/22*

U.S. Cl. 405—153 **6 Claims**



1. A device for assembling two adjoining earth supporting voussoirs (1, 2) of a tunnel shield for a railroad or the like, the voussoirs comprising cylinder segments whose facing sides (7, 8) each have a defined curvature, said device comprising:

a solid, elongate, wedge shaped shim member (12) having a length substantially equal to that of the voussoir sides, and opposite faces (12*a*) of the shim member having curvatures complementary to those of the voussoir sides, said shim member being sandwiched between the facing voussoir sides and matingly engaged therewith during assembly to enable the adjustment of the angle (α) between planes tangent to the outer surfaces (3) of the voussoirs at their interface by the radial positioning of the shim member.

4,594,027

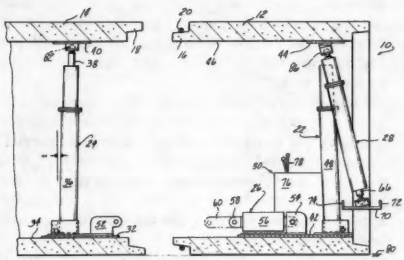
METHOD AND APPARATUS FOR PIPE POSITIONING

Manfred G. Becker, 12851 Durham, Warren, Mich. 48093

Filed Apr. 27, 1983, Ser. No. 488,896

Int. Cl.[4] F16L *1/02*

U.S. Cl. 405—154 **28 Claims**



1. An apparatus for positioning a first pipe resting horizontally on the ground and having a first end and a second end and an inner surface relative to a second pipe also resting horizontally on the ground and having an end and an inner surface, said apparatus being for the interconnection of said first end of said first pipe with said end of said second pipe, said apparatus comprising:

first pipe engaging means disposed in said second end of said first pipe and selectively engageable with the inner surface of said first pipe;

second pipe engaging means independently mounted from said first pipe engaging means, said second pipe engaging means further being disposed in said end of said second pipe and selectively engageable with the inner surface of said second pipe;

interconnection means mechanically interposed said first pipe engaging means and said second pipe engaging means;

first drive means cooperating with said interconnection means and selectively operable to draw said second pipe engaging means towards said first pipe engaging means, such as to draw said first end of said first pipe into engagement with said end of said second pipe; and

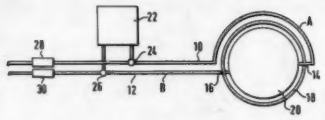
ground engaging means interconnected with said first pipe engaging means and extending from said second end of said first pipe, said ground engaging means further being selectively operable to engage the ground adjacent said second end of said first pipe such as to selectively move said second end of said first pipe relative to the ground.

4,594,028

APPARATUS AND PROCESS FOR THE INJECTION OF METERED AMOUNTS OF PULVERIZED MATERIAL INTO A VESSEL

Léon Ulveling, Howald, Luxembourg, assignor to Paul Wurth S.A., Luxembourg

Filed Sep. 30, 1982, Ser. No. 431,678
Claims priority, application Luxembourg, Oct. 2, 1981, 83671
Int. Cl.[4] B65G *53/66*; F23D *1/00*
U.S. Cl. 406—30 **10 Claims**



1. A process for the injection of metered amounts of pulverized materials by pneumatic means at a plurality of different points into a vessel which is under variable pressure, through a plurality of pneumatic conveyance paths supplied with pulverized materials in a stream of pressurized propellant fluid, comprising the steps of:

(a) determining for each of said conveyance paths a first point at which the pressure loss between the first point and the point of injection of the pulverized material into the vessel is equal for all conveyance paths for a selected density of the pulverized material in the fluid stream;

(b) determining the losses of pressure between each first point and the point of injection for a plurality of pressure levels within the vessel;

(c) monitoring the pressure losses between each first point and the point of injection for each conveyance path during operation of the vessel;

(d) varying the amount of pulverized material in the fluid stream in accordance with changes in pressure in the vessel; and

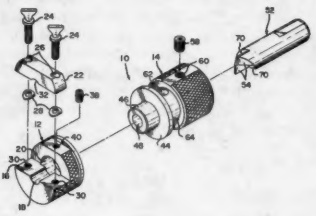
(e) maintaining in each conveyance path a constant pressure loss between the first point and the point of injection in accordance with the amount of pulverized material to be injected into the vessel.

4,594,029

METHOD FOR TRIMMING COAXIAL CABLE

George W. Michael, III, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 408,959, Aug. 17, 1982, abandoned. This application Oct. 26, 1984, Ser. No. 665,194
Int. Cl.[4] H02G *1/12*
U.S. Cl. 408—1 R **4 Claims**



1. A method of trimming an end of a coaxial cable, comprising the steps of:

positioning sections of a cable-holding member and a cutter-holding member at a distance from one another equal to the amount that is to be trimmed from a cable end;

securing the cable-holding member and cutter-holding member together;

clamping the end of the cable to be trimmed in the cable-holding member with the cable end being positioned against cutting blades of a cutter member;

unsecuring the cable-holding member and cutter-holding member from each other;

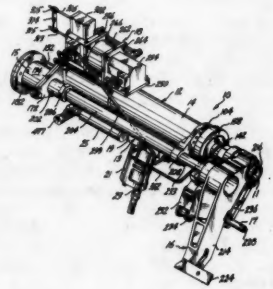
operating the cutter member so that the cutting blades trim the cable end until stop surfaces of the sections engage one another.

4,594,030

PNEUMATIC-HYDRAULIC DRILL UNIT

Matthew J. Weigel, Jr., Black Diamond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 30, 1984, Ser. No. 574,900
Int. Cl.[4] B23B *47/22, 45/04, 45/14*
U.S. Cl. 408—10 **25 Claims**



1. A pneumatic-hydraulic drill unit, comprising:

a casing having a forward end and a rear end and an aperture extending therethrough from said forward to said rear end;

a hydraulically actuated feed cylinder, said feed cylinder being configured for placement within said aperture adjacent said rear end of said casing, said feed cylinder including a cylinder having a forward and a rear end and having a central bore that is substantially parallel to said aperture

of said casing, said feed cylinder further including a piston and a rod that extends forwardly from said piston, said piston and rod configured for axial movement within said bore of said cylinder, said piston being movable between a retracted position wherein said piston is adjacent said rear end of said cylinder and an extended position wherein said piston is adjacent said forward end of said cylinder, said feed cylinder including an extend chamber rearward of said piston and a retract chamber forward of said piston, said rod having a bore extending through its entire length and continuing through said piston;

a pneumatically actuated motor, said motor being configured to fit within said aperture of said casing forward of said feed cylinder, said motor having a forward end and a rear end, said rear end of said motor being affixed to said forward end of said rod of said feed cylinder, said bore of said rod being in fluid communication with said motor to supply pressurized air to said motor, said motor being movable between a rearmost position wherein said piston of said feed cylinder is in said retracted position and a forwardmost position wherein said piston of said feed cylinder is in said extended position;

pneumatically actuated pump means for pressurizing hydraulic fluid for delivery to said feed cylinder;

valve means for controlling the actuation of said drill unit;

first circuit means for supplying air from a source of pressurized air to said bore of said rod, to said pump means, and to said valve means, said first circuit means including means for supplying air to said pump means at times during which air is not being supplied to said bore of said rod; and

second circuit means for supplying pressurized hydraulic fluid to said feed cylinder and to said valve means.

4,594,031

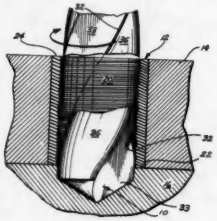
CHIP EXTRACTOR BUSHING

Earl B. Tesmer, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 5, 1984, Ser. No. 658,074

Int. Cl.[4] B23B *49/02*

U.S. Cl. 408—72 B **6 Claims**



1. In a bushing for guiding a rotating cutting member into a workpiece, said bushing comprising a housing having a cylindrical bore extending longitudinally through said housing between a first end and a second end for receiving and guiding said rotating member as said rotating member acts on a workpiece, the improvement comprising: a chip removing groove scored in the wall of said cylindrical bore, said groove extending from said first end to said second end of said cylindrical bore in a counterclockwise helix as viewed from said first end, the slope of said groove with respect to the circumference of said cylindrical bore being less than 50%.

4,594,032

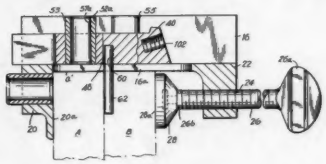
DOWEL JIG

Joseph H. Warburg, Monsey, N.Y., assignor to Areo Products Corp, Englewood, N.J.

Filed Jun. 20, 1983, Ser. No. 505,593

Int. Cl.[4] B23B *47/28*

U.S. Cl. 408—115 R **19 Claims**



1. A dowel jig for positioning first and second workpieces to permit the drilling of corresponding dowel holes therein comprising a first member having a flat surface and a wall extending essentially perpendicular to said flat surface, said wall including at least a first bore hole therein of a predetermined diameter having a center spaced a predetermined distance from said flat surface which defines an axis extending essentially parallel to said flat surface, a second member slideably supported on said first member adjacent said flat surface and slideable in the direction of said axis, said second member having an upper surface facing said flat surface of said first member, said second member including at least second and third bore holes therein of substantially the same diameter as said predetermined diameter of said first bore hole defining a center line, said second and third bore holes each having a center spaced from said center line on opposite sides thereof by said predetermined distance, said second and third bore holes each defining an axis, the axes of said second and third bore holes extending essentially perpendicular to and intersecting said axis of said first bore hole in said first member, and locking means for releasebly locking said second member at a desired position with respect to said wall of said first member to permit simultaneous drilling of two aligned holes in the edges of said first and second workpieces through said second and third bore holes, respectively, to permit said workpieces to be joined at their edges.

4,594,033

BORING TOOL FOR PRODUCING UNDERCUTS IN HOLES

Wolfgang Peetz, Blitzenreute; Siegfried Klaissle, Schlier/Unterankenreute; Bernhard Moser, Altshausen, and Norbert Müller, Wolpertwende, all of Fed. Rep. of Germany, assignors to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,874

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327409

Int. Cl.[4] B27G *15/02*

U.S. Cl. 408—156 **20 Claims**

1. A boring tool for producing undercuts in holes, especially in preformed holes; the boring tool having the improvement therewith which tool comprises:

a resiliently bendable driving shaft having a longitudinal axis and two ends, one of which is adapted to be connected to a turning drive for rotation about the longitudinal axis;

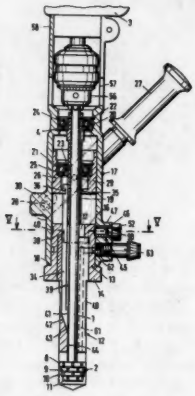
a cutting element of the boring tool located at the other end of said driving shaft;

a housing;

a deflection mechanism which extends shiftable in a guided manner as to an outwardly open location and at least in part in accommodated in said housing; said deflection mechanism including an axially displaceable deflection element for deflecting said resiliently bendable driving shaft at substantially right angles to a longitudinal axis

thereof, at least in the vicinity of said cutting element; said deflection element further being resiliently bendable as adapted to effect positive wedging adjustment of a deflected position of said driving shaft; and

a rotary drive which is separate from said turning drive, and



to which said resiliently bendable driving shaft is drivingly connected; said driving shaft, during its rotation via said turning drive, also being adapted to be revolved additionally by said rotary drive superimposed thereon, when in a deflected position, specifically to effect said production of an undercut simultaneously therewith.

4,594,034

MULTIGROOVE DRILL BIT WITH ANGLED FRONTAL RIDGES

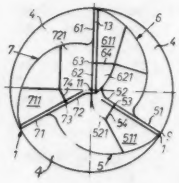
Andreas Maier, Schwendi-Hörenhausen, Fed. Rep. of Germany, assignor to Hartmetallwerkzeugfabrik Andreas Maier GmbH & Co. KG, Schwendi-Hörenhausen, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,266

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3233968

Int. Cl.⁴ B23B *51/02*

U.S. Cl. 408—230 **14 Claims**



1. A drill bit comprising a cylindrical shaft centered on an axis, said shaft having at least three external helical flutes respectively forming at least three lateral cutting edges and at least three angularly equispaced frontal ridges extending generally radially inward from said lateral cutting edges on a forward end face of said shaft, a first one of said ridges forming a first outer cutting edge and a first inner cutting edge along a common radius meeting at a first peak, a second one of said ridges forming a second outer cutting edge and a second inner cutting edge along a common radius meeting at a second peak, a third one of said ridges forming a third outer cutting edge and a third inner cutting edge along a common radius meeting at a third peak, all said outer cutting edges converging forwardly toward said axis, all said inner cutting edges converging rearwardly toward said axis, said first peak lying closer to said axis than said second peak, said second peak lying closer to said axis than said third peak, said first peak projecting axially forward beyond said second peak, said second peak projecting axially forward beyond said third peak, said first inner cutting edge including with said axis a smaller angle than said second cutting edge said second inner cutting edge including with said axis a smaller angle than said third inner cutting edge, said second inner cutting edge extending at least to said axis, said first and third inner cutting edges terminating short of said axis, said outer cutting edges all lying on a common imaginary conical surface centered on said axis, said inner cutting edges lying on imaginary coaxial conical surfaces intersecting one another in a common circle and being centered on a common axis.

4,594,035

DRILLING STAND

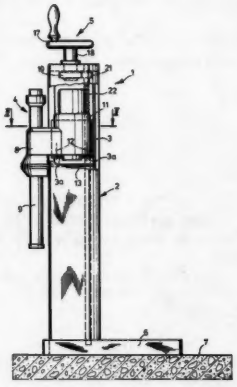
Franz Hoyss, Bad Tölz, and Rudolf Reitberger, Munich, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Sep. 24, 1984, Ser. No. 653,969

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334753

Int. Cl.⁴ B23B *39/00*

U.S. Cl. 408—234 **10 Claims**



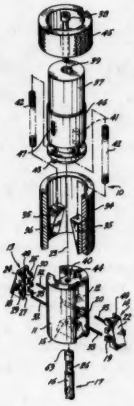
1. Drilling stand comprising axially extending guide column, a drilling unit including a drive member and a receiving part connected to said drive member and said receiving part arranged to receive a drilling tool, a carriage supported on said guide column, said drilling unit mounted on said carriage so that said drilling unit can be moved in the axial direction of said guide column, and means for moving said carriage on said guide column, wherein the improvement comprises that said guide column comprises an axially extending shaped wall member defining an interior space and an axially elongated slot in communication with the interior space and the exterior of said wall member, said wall member forming a plurality of axially extending guides opening to the interior space, said carriage located within the interior space and in sliding contact with said guides, said drive member located within said interior space and supported on said carriage, said receiving part extending outwardly from said drive member through said slot and projecting outwardly from the exterior of said wall member, and said shaped wall member is U-shaped transverse to the axial direction of said guide column.

4,594,036

QUICK CHANGE TOOL CHUCK SYSTEM

Franciscus Hogenhout, Redmond, Wash., assignor to Kenneth R. Muzzy, Seattle, Wash.

Filed May 20, 1983, Ser. No. 496,498
Int. Cl.[4] B23B *31/08*
U.S. Cl. 408—240 33 Claims



1. A quick change tool chuck which holds, centers, and drives any given tool of a set of tools having various shank diameters with each such shank diameter being uniform along the length of the shank and with each such shank having a round portion to be held and centered by the chuck, each such shank further having at least one planar portion extending parallel to the axis of rotation of the tool, to be positively driven by the chuck, with each such planar portion being recessed the same depth in each tool of the set of tools relative to the surface of the round portion thereof, said chuck comprising:

(a) two jaw means for holding, centering, and driving any given tool of the set, each of said jaw means having an inner face defined by multiple intersecting planar surfaces which are parallel to the axis of rotation of the chuck, each of said inner faces comprising a holding and centering portion including plural intersecting planar surfaces parallel to the axis of rotation of the chuck, such holding and centering portions of the jaw means functioning to hold and center any given tool of the set on the axis of rotation of the chuck by making multiple contacts with the round portion of the shank of any given tool of the set, said line contacts being parallel to the axis of rotation of the chuck, and at least one of said jaw inner faces also having a driving portion comprising at least one planar driving surface parallel to and inset toward the axis of rotation of the chuck relative to the holding and centering portion of the inner face thereof, each such planar driving surface functioning to contact and securely, nonrotatively seat the jaw means against a recessed planar portion of the shank of any given tool of the set; and

(b) means for carrying said jaw means and enabling lateral movement of said jaw means with respect to the axis of rotation of the chuck, said carrying means having means for connecting the chuck to a power source;

(c) means for biasing said jaw means away from the axis of rotation of the chuck; and

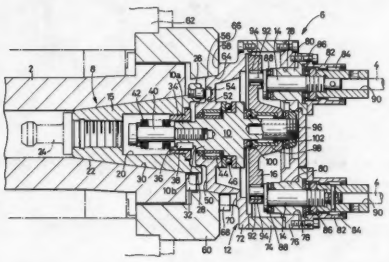
(d) means for urging said jaw means together into contacting relationship with the shank of a given tool.

4,594,037

MULTI-SPINDLE UNIT

Katutoshi Haga; Takehusa Sasamori; Teizi Kurita, and Noriaki Katumata, all of Toyota, Japan, assignors to Fuji Seiko Limited and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Sep. 6, 1984, Ser. No. 647,891
Claims priority, application Japan, Sep. 14, 1983, 58-142863[U]
Int. Cl.[4] B23B *39/16*
U.S. Cl. 409—144 15 Claims



1. A multi-spindle unit for holding a plurality of rotary cutting tools, which is attachable to a first spindle of a machine tool, comprising:

a unit body removably fixed to the first spindle for rotation thereof about an axis of the first spindle;

a rotatable shaft axially and radially displaceable relative to said unit body, and coupled at one end portion thereof to said unit body for receiving torque from said unit body;

a positioning member fixedly disposed radially outwardly of said first spindle;

a casing disposed radially outwardly of said rotatable shaft such that said casing and said rotatable shaft are rotatable relative to each other, said casing being engageable with said positioning member for accurate alignment of a centerline of said casing with said first spindle and for accurate circumferential positioning thereof about said centerline when said unit body is fixed to said first spindle;

a plurality of secondary spindles rotatably disposed in said casing at a plurality of locations radially spaced from an axis of said rotatable shaft, each secondary spindle being rotatable about an axis thereof substantially parallel to said axis of the rotatable shaft and having a tool mounting portion at a free end portion thereof which protrudes from said casing to rotatably support a cutting tool; and

a rotation transmission mechanism disposed within said casing for transmitting rotary movement of said rotatable shaft to said secondary spindles.

4,594,038

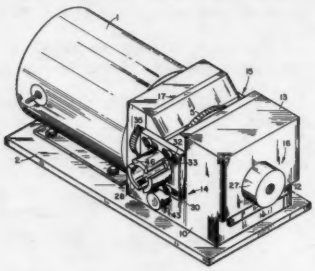
SECONDARY OPERATIONS MACHINE TOOL

Kevin G. Mundelius, and Christian H. Buddenbaum, both of 3011 W. Rte. 120, McHenry, Ill. 60050

Filed Nov. 19, 1984, Ser. No. 673,182
Int. Cl.[4] B23C *3/00, 3/30*
U.S. Cl. 409—205 4 Claims

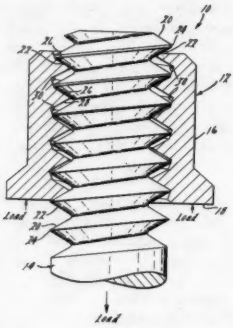
1. A portable apparatus for performing secondary and auxiliary machining functions comprising: a motor having a motor shaft and the motor is mounted on a base and an arbor is secured to the motor shaft and a multiplicity of cutting tools is mounted to the arbor and the arbor and cutting tools are covered by a housing and the housing has secured thereto and passing therethrough a multiplicity of guides by means of which a work piece passing through the guides is accurately guided into at least one of the cutting tools, and wherein the housing is rectilinear in shape, having a first side plate having

mounted thereto first side guide, a second side plate having mounted thereto a second side guide, an end plate having



mounted thereto an end guide, and a top having mounted thereto a top guide.

4,594,039
FASTENER
Erwin C. Witte, Placentia, Calif., assignor to Microdot Inc., Darien, Conn.
Filed May 11, 1981, Ser. No. 262,692
Int. Cl.[4] F16B *39/30*
U.S. Cl. 411—311 **1 Claim**



1. A fastener assembly comprising a male fastener having a substantially uniform thread of substantially uniform pitch and including a top and bottom flank intersecting to define a crest, and a female fastener having a substantially uniform thread sized to receive the male thread but having a pitch greater than the pitch of said male thread, said female thread having a top and bottom flank with a wedge ramp at the root thereof, said wedge ramp being disposed at an acute angle to the central axis of said female fastener and converging in the direction of the surface of said female fastener that receives clamp loads, the number of said female thread convolutions, the pitch of said male fastener and the axial length of said ramp bearing a relationship to one another in accordance with the formula

$$P_n = P_b + L/N$$

wherein

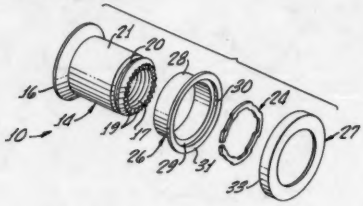
P_n=the pitch of the thread on the nut **12**

P_b=the pitch of the thread on the bolt **14**

L=the axial length of ramp **30**

N=the number of internal threads on the nut **12**.

4,594,040
PANEL FASTENER
Jorge W. Molina, Torrance, Calif., assignor to Deutsch Fastener Corp., El Segundo, Calif.
Division of Ser. No. 527,229, Aug. 29, 1983. This application Apr. 29, 1985, Ser. No. 728,478
Int. Cl.[4] F16B *21/18*
U.S. Cl. 411—353 **5 Claims**



1. In combination with a nut having a head at one end and an elongated cylindrical portion extending therefrom, said cylindrical portion having an outer end, and an annular groove adjacent said outer end, the end of said groove adjacent said head being outwardly flaring toward said head, the opposite end of said groove defining an abutment shoulder, a retaining device for preventing separation of said nut from a workpiece comprising

a grommet having an inner diameter greater than that of said cylindrical portion and less than the outer diameter of said head,

said grommet defining an annular recess,

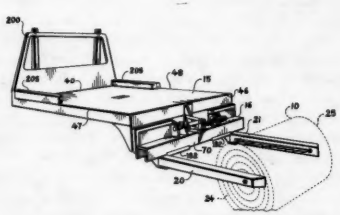
and a resilient washer received in said annular recess,

said washer being of split annular construction so as to have spaced ends, and being inwardly biased so as to bear against said cylindrical portion of said nut,

whereby said washer is adapted to enter said groove and engage said opposite end thereof for preventing separation of said nut from a workpiece, and said washer can be forced out of said groove by engagement with said end of said groove adjacent said head,

said washer being of sheet metal with its principal surfaces in radial planes, the grain of said metal being substantially perpendicular to a diameter of said washer which bisects the space between said ends of said washer.

4,594,041
TRUCK BED BALE LIFT
Dewey L. Hostetler, Harper, Kans., assignor to DewEze Manufacturing, Inc., Harper, Kans.
Filed Jan. 22, 1985, Ser. No. 693,619
Int. Cl.[4] B65H *75/00*
U.S. Cl. 414—24.5 **6 Claims**



6. A truck bed bale lift assembly, mountable on a vehicle such as a truck, for loading, transporting and unloading large bales of hay; said assembly comprising:

(a) flatbed portion upon which said bales are loaded and

transported; said flatbed portion having an upper surface, a lower surface, first and second side edges, a front edge and a rear edge;

(i) said flatbed portion lower surface having vehicle frame engaging means thereon for selectively securing said truck bed bale lift assembly to the frame of said vehicle beneath said upper surface;

(b) bale loader assembly mounted on said flatbed portion; said bale loader assembly having pivoting means, crossbar means, first and second hugger arms, and expansion means;

(i) said crossbar means being pivotally mounted substantially adjacent said flatbed portion rear edge and being pivotable between first and second extreme positions to load or unload an engaged bale;

(ii) said hugger arms extending for a length substantially less than said flatbed portion and being slidably mounted on said crossbar means; said hugger arms being oriented to rest on said flatbed portion upper surface when said crossbar means is in said first extreme position and said crossbar means having an upper surface with contraction cuts therein for movement or said hugger arms;

(iii) said expansion means including a double action expansion and contraction assembly engaging said hugger arms to selectively slide same toward or away from one another, to grip or release a large bale of hay;

(iv) said pivoting means being mounted substantially underneath said flatbed portion upper surface, with portions extending generally rearwardly therefrom, said pivoting means selectively rotating said crossbar means between said first and second extreme positions; and

(c) side rails extending rearwardly from said front edge generally along said flatbed portion side edge, said side rails being of substantially less length then said flatbed portion;

(i) said hugger arms being selectively positionable, by said expansion means and said pivoting means, to align said hugger arms generally colinearly with said side rails and cooperate therewith to form elongate rail members extending substantially completely along said flatbed portion side edges;

(d) whereby said hugger arms, when not is use, function as continuations of said side rails on said flatbed portion upper surface.

4,594,042

DEVICE FOR STACKING MICROCASSETTES

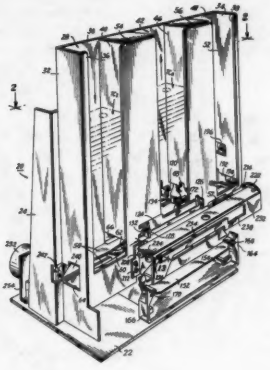
Wayne C. Hoffman, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 9, 1984, Ser. No. 629,157

Int. Cl.[4] B65G *57/30, 60/00;* **G11B** *15/68, 23/04*

U.S. Cl. 414—32 **9 Claims**

5. Apparatus for stocking articles transported thereto in a predetermined direction, comprising: a hopper formed of plural vertical walls for storing a stack of articles; an entry into said hopper through which an article is transported; a flapper disposed in the vicinity of said entry and normally blocking said entry from free passage of an article therethrough; and pivot support means for supporting said flapper and for defining a pivot axis substantially normal to said predetermined direction; whereby said flapper pivots about said pivot axis in response to a force exerted thereon by an article transported thereto so as to raise the stacked articles stored in said hopper



by reason of the pivoting thereof and to admit the transported article into the bottom of said stack.

4,594,043

BANKNOTE COUNTING AND BANDSEALING DEVICE

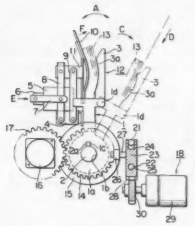
Hikaru Kawano, Odawara; Koji Sato, Hiratsuka, and Hiroyoshi Nogi, Tokyo, all of Japan, assignors to Musashi Co., Ltd., Tokyo and Hitachi Denshi Engineering Kabushiki Kaisha, Kanagawa, both of, Japan

Filed Dec. 14, 1983, Ser. No. 561,561

Claims priority, application Japan, Dec. 22, 1982, 57-223923

Int. Cl.[4] B65B *13/18*

U.S. Cl. 414—43 **3 Claims**



1. A banknote stacker movable between a stacking position and a bandsealing delivery position spaced from said stacking position, said stacker comprising:

a vertically extending presser wall and an opposed, stacker wall piece spaced from said presser wall for receiving banknotes therebetween, said presser wall being mounted for movement toward and away from said stacker wall piece;

mounting means mounting said stacker wall piece for rotation around a horizontal axis toward and away from said presser wall and mounting said presser wall and said stacker wall piece for movement from said stacking position to said bandsealing delivery position and vice versa, said mounting means comprising a rotatable shaft, said stacker wall piece being mounted on said shaft for rotation by said shaft but being slidable axially along said shaft;

first driving means for rotating said stacker wall piece around said axis and toward and away from said presser

wall, said first driving means comprising energizable drive means connected to said shaft for rotating the latter;

second driving means for moving said presser wall toward and away from said stacker wall piece; and

third driving means for moving said presser wall and said stacker wall piece from said stacking position to said bandsealing delivery position and vice versa.

4,594,044

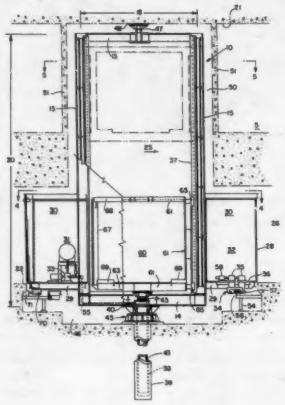
ROTATING TRUCK LIFT

Olaf Soot, 9 Tomahawk La., Greenwich, Conn. 06830

Filed Aug. 8, 1983, Ser. No. 521,278

Int. Cl.[4] E04H *6/08*

U.S. Cl. 414—263 **19 Claims**



1. A rotating lift comprising a vertically-oriented structure tower extending from a first level to a second level, a lift platform mounted within the tower such that said platform is capable of only vertical displacement relative to said tower, lift means connected to the platform for vertically moving said platform within the tower between a first position horizontally aligned with the first level and a second position vertically aligned with said first position and horizontally aligned with the second level, bearing means for rotatably supporting said tower, and means for rotating said tower over a given angular range, said lift platform being arranged such that an axis of rotation of said tower passes through said lift platform.

4,594,045

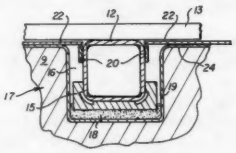
HOLD DOWN AND SEALING ASSEMBLY FOR DISCHARGER MECHANISM

Anthony W. Hooper, Montreal, Canada, and Alexander D. Cormack, Marietta, Ga., assignors to Uniweld Inc., Sherbrooke, Canada

Filed Jun. 15, 1984, Ser. No. 621,260

Int. Cl.[4] B65G *25/04*

U.S. Cl. 414—325 **9 Claims**



1. A discharger mechanism for discharging solid materials from the underside of a pile disposed on a support surface, said discharger mechanism comprising:

a stoker rod extending beneath the pile,

a plurality of stoker cross bars spaced apart along and rigidly attached to, said stoker rod,

means for supporting said stoker rod within a trough formed on the support surface such that said cross bars contact the solid materials in the pile,

reciprocating means for longitudinally reciprocating said stoker rod so that the cross bars cause movement of the solid materials, and

means for holding down said rod and for sealing the trough against entry of solid materials from the pile, comprising:

(i) a pair of longitudinally extending hold down members attached to opposite sides of said rod and extending along the length of said rod adjacent to its upper surface, and

(ii) a pair of sealing members secured to opposite sides of said trough and extending inwardly therefrom to points above and adjacent to the upper edges of said pair of hold down members to provide sealing of the trough and to prevent materials from entering said trough.

4,594,046

MOBILE APPARATUS FOR MIXING AND LOADING CONCRETE

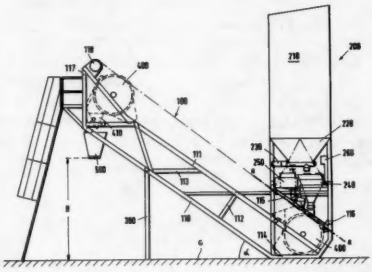
Gerhard Bruder, Rastatt, and Horst Pippinger, Karlsruhe, both of Fed. Rep. of Germany, assignors to Elba-Werk Maschinengesellschaft mbH & Co., Ettingen, Fed. Rep. of Germany

Division of Ser. No. 445,043, Nov. 29, 1982, Pat. No. 4,548,538. This application Mar. 6, 1985, Ser. No. 708,697

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149130; Sep. 8, 1982, 3233292

Int. Cl.[4] B28C *9/04*

U.S. Cl. 414—332 **4 Claims**



1. An apparatus for preparing bulk material and loading same into a truck, the apparatus comprising a foldable assembly transportable as a unit to an erection site and including:

an elongated generally parallelepipedal first frame having a lower end and being provided with a hopper and means for metering out bulk material from said hopper at said lower end;

a horizontal pivot at the lower end of the first frame;

an elongated generally parallelepipedal second frame having a lower end pivoted to said first frame at the pivot on the lower end of the first frame and an upper end, said first and second frames each having respective opposite elongated longitudinal sides, the frames being relatively pivotally displaceable between a transport position with said first frame lying generally parallel to but within said second frame between the ends thereof and said longitudinal sides generally horizontal and a use position with the two frames extending at an angle to each other, the upper end of the second frame spaced above the ground by a dis-

tance equal to the loading height of the truck and the longitudinal sides of said first frame vertical;

a rail extending between the ends of the second frame;

a bucket displaceable along the rail between the ends of the second frame;

means on the second frame for displacing the bucket along the rail between the ends thereof; and

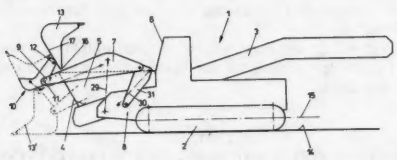
means at the lower end of the first frame for filling the bucket, when same is at the lower end of said second frame, with bulk material.

4,594,047

CONVEYING MEANS FOR REMOVING A HEAP OF DEBRIS

Eduard Krivec, and Helmut Gradenegger, both of Zeltweg, Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Apr. 30, 1984, Ser. No. 605,284
Claims priority, application Austria, May 5, 1983, 1662/83
Int. Cl.[4] B65G *47/16*
U.S. Cl. 414—565 **5 Claims**



1. Apparatus for removing and conveying a heap of debris comprising: a frame; a continuous conveyor supported by the frame, the conveyor having a charging end and a discharging end; two longitudinally extending, transversely spaced-apart cantilever arms having outer free ends and having inner ends pivotally supported on said frame for swinging movement about a horizontal transverse arm pivot axis between lowered and raised positions; a transverse crossbeam extending between the outer free ends of said arms and pivoted thereto from swinging movement about a horinztonal beam axis; a loading shovel having an open front for shoveling up debris and a back wall which has an upper edge; means pivoting said shovel to said crossbeam for swinging movement about a horizontal shovel pivot axis which is located near said upper edge of said back wall, the arrangement of shovel, crossbeam and arms being such that in the lowered position of said arms, said shovel pivot axis is above said beam axis and said shovel is swingable to a lowered, loading position in engagement with said beam for shoveling in debris and such that in the raised position of said arms said shovel is swingable to a raised position in which said upper edge of said back wall forms a discharge edge for discharging shoveled material to the charging end of the conveyor; means supported on at least one of said arms and acting on said crossbeam for swinging same about said beam pivot axis; means supported on said crossbeam for swinging said shovel about said shovel pivot axis; and means for swinging said arms about said arm pivot axis.

4,594,048

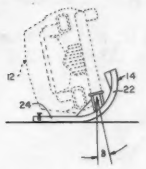
VEHICLE LIFTING DEVICES

Vaclav A. Sipla, 189 River St., Waltham, Mass. 02154

Filed Oct. 1, 1984, Ser. No. 656,436
Int. Cl.[4] B66F *7/22*
U.S. Cl. 414—678 **1 Claim**

1. A vehicle lifting device for tilting a vehicle sideways and supporting said vehicle in said sideways tilt, said device comprising

a pair of bearers, each of substantially identical J-shape with an arcuate section subtending an angle in excess of 90 degrees and a straight section, the convex surface of said arcuate section being designed for rolling contact with a supporting surface and the straight section being continuous with and tangent to an end of said arcuate section, said bearers each including mounting means projecting inwardly from the concave side of said arcuate section adjacent said straight section, said mounting means including means for securing said mounting means to a vehicle wheel hub so that said wheel would be inclined toward



said straight section by approximately the angle by which said arcuate section exceeds 90 degrees; and

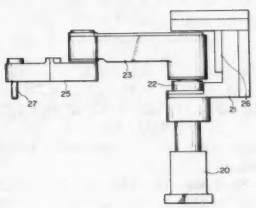
a detachable tie member for connecting together the portions of said straight sections distal said arcuate sections so that said bearers are maintained substantially parallel to one another and spaced apart by a distance equivalent to the wheel base of said vehicle and so that said arcuate sections are substantially coaxial.

4,594,049

ROBOT ARTICULATION DEVICE

Tsuneo Terauchi, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 510,862
Claims priority, application Japan, Jul. 2, 1982, 57-114908
Int. Cl.[4] B66C *23/00*
U.S. Cl. 414—744 R **7 Claims**



1. A robot articulation device comprising a support stand, a first arm pivotally mounted at one end thereof on said support stand for rotational movement about a first axis, a second arm pivotally mounted on the free end of said first arm for rotational movement about a second axis parallel to said first axis, first drive means for rotating said first arm about said first axis including a first motor mounted on said support stand and second drive means for rotating said second arm about said second axis including a second drive motor mounted on said support stand, an input shaft rotatably mounted in the free end of said first arm for rotation about said second axis, transmission means interconnecting said input shaft and said second drive motor, first and second opposed recesses located in said first and second arms respectively concentric with said second axis, a sleeve secured to one of said first and second arms and extending into the recess in the other of said first and second arms, first bearing means interposed between said sleeve and the respective recess whereby said second arm may be rotated 360° about said second axis, projection means secured to the other of said first and second arms and projecting into said sleeve co-axially therewith, second bearing means interposed between said sleeve and said projection means and reduction

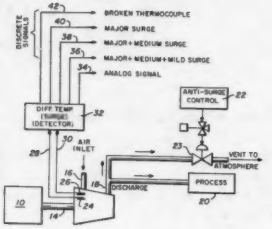
gear means interposed between said input shaft and said second arm for transmitting rotation from said input shaft to said second arm at a reduced speed.

4,594,050

APPARATUS AND METHOD FOR DETECTING SURGE IN A TURBO COMPRESSOR

John R. Gaston, Allegany, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 14, 1984, Ser. No. 609,703
Int. Cl.[4] F01D *17/02*
U.S. Cl. 415—1 **13 Claims**



1. A surge detector for a rotating compressor having a compressor stage with a gas inlet and a gas outlet and experiencing rapid changes in inlet temperature as said surges occur, said detector comprising:

a. means mounted in said compressor inlet for generating electrical signals representing only those temperature changes therein which are due to surge conditions, and

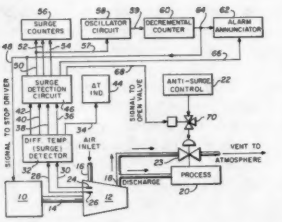
b. means coupled to said generating means for receiving electrical said signals representing said temperature changes and producing control signals based upon said temperature changes in said inlet to detect the number, duration and magnitude of said surges.

4,594,051

SYSTEM, APPARATUS, AND METHOD FOR DETECTING AND CONTROLLING SURGE IN A TURBO COMPRESSOR

John R. Gaston, Allegany, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 14, 1984, Ser. No. 609,705
Int. Cl.[4] F01D *21/12*; F04B *49/00*; G01K *13/02*
U.S. Cl. 415—48 **30 Claims**



1. A surge detection system for a compressor having a gas inlet and a gas outlet and experiencing rapid temperature changes in said gas inlet during surges, said detector comprising:

a. first and second thermocouples having different temperature response times, Tf and Ts respectively, and producing an electrical output proportional to said rapid temperature change occurring during a surge,

b. means for mounting said first and second thermocouples in said compressor gas inlet such that both thermocouples are subject to the same temperature changes,

c. means for electrically coupling said thermocouples to algebraically sum said electrical outputs to represent the rapid change in temperature occurring between said thermocouples, and

d. means coupled to said thermocouples for converting said algebraically summed outputs to control signals representing the number, intensity and duration of said surges.

15. A method of detecting surges in a compressor having a gas inlet and a gas outlet and experiencing rapid temperature changes in said gas inlet during surges, said method comprising the steps of:

a. mounting first and second thermocouples in said compressor gas inlet such that both thermocouples are subject to the same temperature changes, said first and second thermocouples having different temperature response times, Tf and Ts, and producing an electrical output proportional only to said rapid temperature changes occurring during a surge,

b. electrically coupling said thermocouples to algebracially sum said electrical outputs to represent the rapid change in temperature occurring between said thermocouples, and

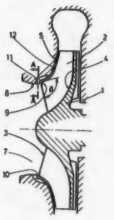
c. converting said algebracially summed outputs to control signals representing the number, intensity and duration of said surges.

4,594,052

CENTRIFUGAL PUMP FOR LIQUIDS CONTAINING SOLID MATERIAL

Toivo Niskanen, Hamina, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

PCT No. PCT/FI83/00008, § 371 Date Sep. 20, 1983, § 102(e) Date Sep. 20, 1983, PCT Pub. No. WO83/02806, PCT Pub. Date Aug. 18, 1983
PCT Filed Feb. 8, 1983, Ser. No. 541,331
Claims priority, application Finland, Feb. 8, 1982, 820388
Int. Cl.[4] F04D *29/42*
U.S. Cl. 415—121 B **2 Claims**



1. A centrifugal pump for liquids containing solid material comprising a housing (7), a multi-vane impeller (1), each of the vanes (2) having an outer edge (5), an inner edge (4), and a leading edge (3), said leading edge being curved backwardly in a bottom projection, with respect to the direction of rotation of the impeller, whereby the inner edge (4) runs ahead of the outer edge during rotation, said leading edge and outer edge forming angles (β, ρ) which are obtuse in a meridian and a bottom projection respectively; said leading edge and inner edge forming an acute angle in the bottom projection, said leading edge having an outer end (10), said housing having an inner wall (8), said inner wall being provided with a shoulder (9) which forms a recess, said outer end (10) of the leading edge being positioned behind said shoulder (9) and within said recess, at least one of said shoulder and the inner wall of the housing being provided with at least one groove (11) having a cutting edge (13) which cooperates with the outer end of the leading edge of the vane for cutting said solid material.

4,594,053

HOUSING FOR A FLUID FLOW OR JET ENGINE

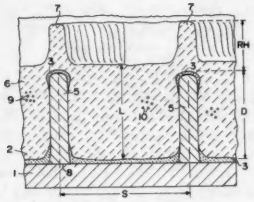
Joachim Söhngen, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,494

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1984, 3413534

Int. Cl.[4] F01D *11/08*

U.S. Cl. 415—174 10 Claims



1. A housing for a fluid flow engine, comprising a coolable housing wall means having a radially inwardly facing surface, a metallic rib carrier means including recesses being rigidly secured to said radially inwardly facing surface of said housing wall means, and a cover layer applied by thermal spraying to said wall surface and said ribs of the metallic rib carrier means, said cover layer comprising a rub-tolerant stabilized zirconium oxide forming a corrosion and errosion resistant ceramic material made of stabilized zirconium oxide powder of irregularly shaped, fine-grained particles which substantially completely fill said recesses, said particles covering said rib carrier means to form said cover layer as an uninterrupted coating intimately bonded by said thermal spraying to said metallic rib carrier means, said cover layer further forming relatively narrow ridges on the ribs of said rib carrier means, said ridges projecting above said ribs radially inwardly for directly facing blade tips of a rotor in said housing, whereby a gap between said housing means and said rotor may be maintained substantially constantly at a minimal gap width.

4,594,054

ION PUMP

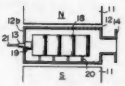
Hajime Ishimaru; Katsuya Narushima, and Takashi Momose, all of Sakura, Japan, assignors to Hajime Ishimaru, Ibaraki, Japan

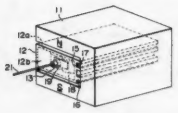
Filed Nov. 18, 1983, Ser. No. 553,241

Claims priority, application Japan, Dec. 28, 1982, 57-232749

Int. Cl.[4] F04B *37/02*

U.S. Cl. 417—49 16 Claims





1. An ion pump comprising: a pump casing placed in a magnetic field, the pump casing having an outer surface in which is provided a heater groove, an electric sheath heater disposed in the heater groove for baking, an anode supported by insulators within the pump casing, the pump casing and anode both being made of aluminum-based metals, and the whole of the pump casing serving also as a cathode.

4,594,055

PISTON ASSEMBLY FOR A REFRIGERANT COMPRESSOR

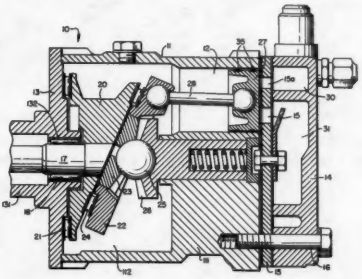
Hideharu Hatakeyama, and Hidenao Takahashi, both of Isesaki, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Dec. 20, 1984, Ser. No. 684,332

Claims priority, application Japan, Dec. 20, 1983, 58-197942[U]

Int. Cl.[4] F04B *1/18;* F01B *31/10*

U.S. Cl. 417—269 6 Claims



1. In a refrigerant compressor including a compressor housing having a plurality of cylinders and a crank chamber adjacent said cylinders, a reciprocable piston slidably fitted within each of said cylinders, a driving mechanism coupled to said pistons to move said pistons in a reciprocating motion, a valve plate with valve openings covering one end of said cylinders and a cylinder head covering said valve plate and including a suction chamber and a discharge chamber aligned with said valve openings, the improvement comprising two annular grooves provided toward opposite ends on the outer peripheral surface of each of said pistons and a conical shaped piston ring disposed within each of said annular grooves having an outer diameter larger than the outer diameter of said piston at normal temperatures, one of said piston rings on each piston being disposed on the outer portion of said piston with the base of said conical shaped piston ring facing the outer side of said piston toward said valve plate.

4,594,056

HYDRAULIC PUMP UNIT

Rudolf Brunner, Baldham, Fed. Rep. of Germany, assignor to Heilmeier & Weinlein, Fabrik fur Oel-Hydraulik GmbH & Co., KG, Munich, Fed. Rep. of Germany

Filed Sep. 8, 1980, Ser. No. 185,274

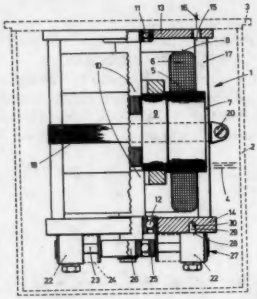
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1979, 2936669

Int. Cl.[4] F04B *27/04, 35/04;* H02K *15/00*

U.S. Cl. 417—271 7 Claims

1. A hydraulic pump unit comprising a pump and including an electric motor for driving the pump, the stator of said motor being disposed in a housing defining an oil reservoir and the rotor of said motor being mounted on a rotor shaft which operates the pump, further comprising a pair of end shields respectively mounting a rotor shaft bearing opposite each end of said stator, said pump being supported by at least one such end shield, and further comprising elongated connecting members extending between said end shields substantially parallel to the axis of said shaft, characterized in that the connecting members are designed as rods (17) distributed about the outer

circumference (7) of said stator (5) and, when undeformed, guide the stator (5) on the outer circumference thereof (7) in a close sliding fit, and that a tightening strap (19) encompasses



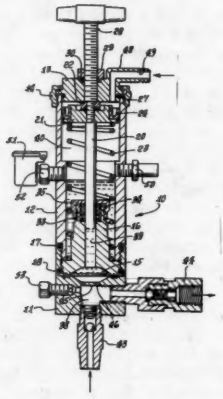
said rods (17) and the outer stator circumference (7), which strap deforms the rods (17) radially inward until said stator is fixed in a position by the strap pressing said rods against the stator circumference.

4,594,057

INJECTOR PUMP

Morris E. Morgan, Valencia, Calif., assignor to Morgan Products, Inc., Valencia, Calif.

Filed Jun. 10, 1985, Ser. No. 742,935
Int. Cl.[4] F04B *9/10*
U.S. Cl. 417—385 **16 Claims**



1. In an injector pump for introducing metered amounts of fluid into a process line or the like, the combination of:

a housing;

a flexible and fluid impermeable member mounted in said housing defining a pump chamber and a piston chamber in said housing;

a piston positioned in said piston chamber and having a piston plunger;

said housing including a piston plunger guide carried in said piston chamber with said piston plunger slidingly positioned in said guide defining a pressure chamber between said plunger and said impermeable member;

a high pressure seal carried in said plunger guide, with said plunger sliding in said high pressure seal, and with said pressure chamber closed by said impermeable member, said piston plunger and said high pressure seal; and

means for moving said piston toward and away from said impermeable member;

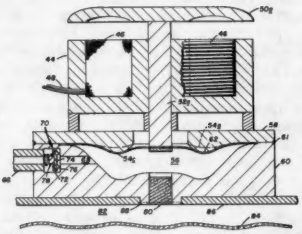
with said high pressure seal including means for leaking fluid along said plunger when fluid between said plunger and impermeable member is under low pressure providing a low pressure across said high pressure seal, and for sealing about said plunger to prevent fluid leakage along said plunger when fluid between said plunger and impermeable member is under high pressure resulting from movement of said piston toward said impermeable member providing a high pressure across said high pressure seal.

4,594,058

SINGLE VALVE DIAPHRAGM PUMP WITH DECREASED SENSITIVITY TO AMBIENT CONDITIONS

Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation of Ser. No. 616,256, Jun. 1, 1984, abandoned. This application Nov. 26, 1985, Ser. No. 801,513
Int. Cl.[4] F04B *43/00*
U.S. Cl. 417—413 **11 Claims**



1. A positive displacement pump, comprising:

a pump chamber;

a passageway providing bidirectional fluid communication between said pump chamber and a source of liquid to be pumped;

an outlet valve and conduit in fluid communication with said pump chamber;

a variable volume means for increasing the volume of said pump chamber during an intake stroke and for decreasing the volume of said pump chamber during an output stroke, wherein liquid is drawn through said passageway into said pump chamber during said intake stroke, said output stroke being rapid compared to said intake stroke; and,

an inlet filter means having a flow resistance characteristic which is identical for both inflow and outflow and is positioned in said passageway for permitting filling of said pump chamber at a first, comparatively slow rate during said intake stroke and cooperates with said variable volume means for generating sufficient fluid pressure in said pump chamber during a second, comparatively rapid output stroke to open said outlet valve and eject a substantial volume of liquid from said pump chamber.

4,594,059

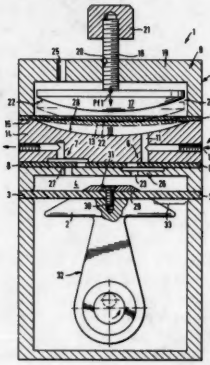
DIAPHRAGM PUMP

Erich Becker, Gloecklehofweg 13, D-7812 Bad Krozingen, Fed. Rep. of Germany

Continuation of Ser. No. 442,448, Nov. 17, 1982, abandoned. This application Mar. 27, 1985, Ser. No. 716,602
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147218; Mar. 19, 1982, 3210110; Jul. 8, 1982, 3229528
Int. Cl.[4] F04B *11/00, 39/08*
U.S. Cl. 417—439 **38 Claims**

1. A diaphragm pump for liquids, comprising a housing

having a pumping chamber; a pump diaphragm adjacent said chamber and having a central region; a supporting member for the central region of said pump diaphragm; a piston connected with said diaphragm and arranged to perform alternating aspiration and exhaust strokes to thereby draw liquid into and expel liquid from said chamber, said diaphragm having an elastically deformable portion the extent of deformation of which is a function of the quantity of liquid in said chamber; means for moving said piston to thereby displace said piston and vary the volume of said chamber; flow control means having a variable-volume oscillating chamber arranged to absorb pressure impacts of the liquid during aspiration strokes



of said piston and to receive at least during the last stage of each aspiration stroke that liquid which can no longer enter said pumping chamber as well as to admit at least during the initial stage of each aspiration stroke into the pumping chamber liquid which has entered the oscillating chamber during the preceding aspiration stroke; liquid admitting means including an inlet opening provided in said housing and communicating with said chambers during the aspiration strokes of said piston; a flexible diaphragm adjacent said oscillating chamber; and means for adjusting the position of said flexible diaphragm and for simultaneously adjusting the effective volume of said oscillating chamber.

4,594,060

ROTARY PUMP FOR BLOOD AND OTHER SENSITIVE LIQUIDS

Walter Schwab, Kahlsperg 694, A-5411 Oberalm, Austria

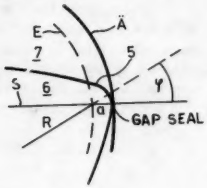
Continuation of Ser. No. 493,694, May 11, 1983, abandoned.
This application May 15, 1985, Ser. No. 734,762
Claims priority, application Austria, May 12, 1982, 1857/82; Jan. 20, 1983, 171/83
Int. Cl.[4] F04C *2/22*; A61F *2/22*; A61M *1/12*
U.S. Cl. 418—54 **7 Claims**

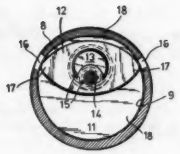
1. A rotary blood pump for the displacement of blood, comprising:

a housing having a peripheral wall and a pair of lateral walls, said peripheral wall being rigid having a single-lobe trochoidal surface defining a pumping chamber with said lateral walls;

an intake port and a discharge port opening into said chamber and formed in said housing; and

a rotary piston eccentrically mounted in said chamber and eccentrically driven therein to displace blood from said intake port to said discharge port, said rotary piston having a pair of opposite edges spacedly juxtaposed directly with said surface and describing a theoretical epitrochoid (E) upon orbiting said chamber as said rotary piston is eccentrically driven therein, said edges being formed with circular arc curvature whose radius is smaller than an equidistant (a) from the center of said curvature to said surface whereby said curvature and said surface define a gap seal having a minute constant width sufficiently small to prevent substantial blood flow therepast and sufficient to prevent damage to blood cells by shear stress as said edges sweep along said surface, said curvature having a center substantially coinciding with the intersection of





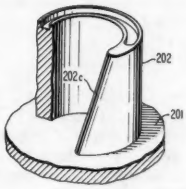
said epitrochoid (E) and a piston symmetry axis extending through both of the piston edges, said lateral walls defining with corresponding flanks of said piston a minute constant spacing of a width forming a gap seal sufficiently small to prevent substantial blood flow therepast and sufficient to prevent damage to blood cells by shear stress as said flanks sweep along said lateral walls.

4,594,061

SCROLL TYPE COMPRESSOR HAVING REINFORCED SPIRAL ELEMENTS

Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 540,549, Oct. 11, 1983, abandoned.
This application Oct. 7, 1985, Ser. No. 783,812
Claims priority, application Japan, Oct. 9, 1982, 57-152746[U]
Int. Cl.[4] F01C *1/04, 21/08*
U.S. Cl. 418—55 **4 Claims**



1. In a scroll type fluid displacement apparatus having a housing, first and second scrolls within said housing, said first scroll being fixedly disposed relative to said housing and having an end plate from which a first spiral wrap extends into the interior of said housing, said second scroll being movably disposed for non-rotative orbital movement within the interior of said housing and having an end plate from which a second spiral wrap extends, said first and second wraps having a rectangular shaped cross-section and interfitting at an angular and

radial offset to form a plurality of line contacts and axial contacts to define at least one pair of sealed off fluid pockets, and a driving and rotation preventing mechanism operatively connected to said second scroll to effect the orbital motion of said second scroll while preventing rotation thereof, thus causing said at least one pair of fluid pockets to change in volume due to the orbital motion of said second scroll, an improvement wherein the proximal portion of the inner terminal end of each of said spiral wraps is provided with an extension such that the cross-sectional area of said spiral wraps along said proximal portion is larger than the cross-sectional area along the distal portion of said inner end, wherein the strength and rigidity of said first and second wraps are increased.

4,594,062

VANE TYPE ROTARY COMPRESSOR WITH ROTARY SLEEVE

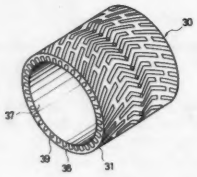
Hiroshi Sakamaki, Tochigi; Susumu Sugishita, Saitama; Yukio Horikoshi, Saitama, and Kikuji Yanagihashi, Saitama, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1983, Ser. No. 559,814

Claims priority, application Japan, Dec. 11, 1982, 57-216296

Int. Cl.⁴ F04C *18/348*

U.S. Cl. 418—173 **5 Claims**



1. A rotary compressor comprising

a center housing and front and rear side housings,

a rotary sleeve rotatably mounted in said center housing and front and rear side housings,

a rotor eccentrically disposed in said rotary sleeve, said rotor containing a plurality of vanes which are radially and movably fitted therein, and

a plurality of air-guide grooves formed in the opposite side surfaces of said rotary sleeve and peripherally separated from each other, said air-guide grooves extending radially from the inner periphery of said rotary sleeve to the outer periphery of said rotary sleeve.

4,594,063

EXTRUDER OR CALIBRATING DIE

Hans Reifenhäuser, Troisdorf; Heinz Beisemann, Cologne; Paul Reitemeyer, Troisdorf-Bergheim, and Robert Grabowski, Troisdorf, all of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

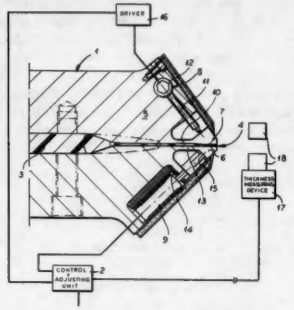
Filed Jul. 25, 1985, Ser. No. 759,054

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427915

Int. Cl.⁴ B29C *47/92*; H01L *41/00*

U.S. Cl. 425—141 **11 Claims**

1. In a die, for thermoplastic material, comprising at least one output-gap-defining adjustable die lip, an opposing gap-bounding lip, at least one adjusting element working on said output gap-defining adjustable die lip, and a control and adjusting device for regulating the thickness of the extruded plastic product operatively connected to said adjusting element, the



improvement wherein said adjusting element is a field translator.

4,594,064

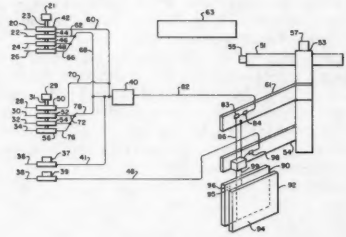
AUTOMATED APPARATUS FOR PRODUCING GRADIENT GELS

Norman L. Anderson, Clarendon Hills, Ill., assignor to The United States of America as represented by the United States Department of Energy

Filed Nov. 10, 1983, Ser. No. 550,429

Int. Cl.⁴ B29C *31/10*; G01N *27/28*

U.S. Cl. 425—145 **5 Claims**



1. Apparatus for producing a gradient gel having a variation in composition along the height of the gel, the gel being useful as in providing a standard medium for a two-dimensional electrophoretic analysis of proteins and having a density gradient along said height resulting from said variation in composition, the apparatus comprising:

mixing means for forming said gel composition from light and heavy combinations of gel ingredients,

first and second means for transferring the light and heavy combinations of gel ingredients to said mixing means including first and second pumping means,

motor means for incrementally driving said pumping means for providing a predetermined quantity of said light and heavy combinations of gel ingredients,

a hollow form for receiving said gel composition,

first transfer means including a first filler tube for transferring said gel composition from said mixing means to said hollow form to provide a predetermined amount of said gel composition in said form, the filler tube extending to a position near the bottom of the form,

adjustment means for adding a small quantity of said heavy combination of gel ingredients through said first filler tube to move said gel composition to a predetermined height,

means for limiting the gel composition to said predetermined height in said form,

arm means for sequentially withdrawing the filler tube and relocating said tube in an opening in the next adjacent hollow form, including vertical and horizontal adjustment means, and

digital computer means for providing digital signals to drive said motor means and said arm means.

4,594,065

DRIVE CONTROL APPARATUS FOR AN INJECTION-MOLDING MACHINE

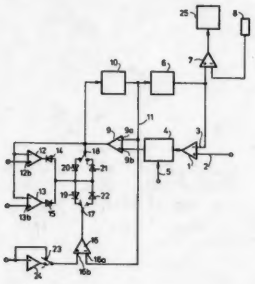
Jacques A. E. Langlois, Vellmar, and Klaus A. Liebetraut, Kassel, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1984, Ser. No. 645,879

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331648

Int. Cl.[4] B29C *45/64, 45/76*

U.S. Cl. 425—150 16 Claims



1. An arrangement for controlling a drive for a movement of a tool with the use of a pick-up device for determining an actual displacement of the tool so that the tool movement is determined in a displacement-dependent manner comprising: means for preadjusting a required displacement value corresponding to a required movement sweep of the tool, a calculation member for converting a given delay of the tool movement into a signal value corresponding to a speed of movement of the tool, and an integrator which derives from a calculated speed signal value a required displacement value as a function of time, by which upon movement of the tool the means for preadjusting the required displacement value is continuously readjusted, and a comparison device for deriving a control value for the drive by a comparison of the required displacement value with the actual displacement determined by the pick-up device.

11. An apparatus for controlling a drive mechanism for the movement of parts of a machine comprising: a displacement pick-up device for deriving a position value signal indicative of an actual position of a machine part whose movement is to be controlled, an input terminal for a command signal indicative of a desired movement sweep of the machine part, a first comparator having a first input coupled to said input terminal and a second input, a calculation member having a first input coupled to an output of the first comparator and a second input coupled to a terminal which supplies a signal indicative of a given delay of the machine part movement, said calculation member being responsive to signals at the first and second inputs thereof for deriving at an output thereof an output signal having a signal value corresponding to a speed of movement of the machine part, first means for coupling said output of the calculation member at which the output speed value signal appears to an input of an integrator which in turn derives from the speed value signal a signal indicative of the required position value of the machine part, second means for coupling said required position value signal to the second input of the first comparator and to one input of a second comparator, third means for coupling the actual position value signal from the pick-up device to an other input of the second comparator, and means for applying an output signal of the second comparator to a drive device for movement of said machine part.

4,594,066

PRESSURE RELIEF APPARATUS

Belvin L. Graham, Astoria, Oreg., assignor to Carruthers Equipment Co., Warrenton, Oreg.

Filed Jun. 25, 1984, Ser. No. 624,219

Int. Cl.[4] B65B *1/24*

U.S. Cl. 425—151 11 Claims

1. A food packing machine having a cake forming cavity comprising:

a piston mounted for reciprocation toward and away from an entrance to the cavity to apply pressure to the material in the cavity;

spring-biasing means mounted to said piston so that at least a portion of the reciprocation of said piston is spring-biased;

pressure relief means including a plunger mounted to said spring-biasing means to be selectively displaced away from said piston for reducing the spring-biasing force applied to the piston and thereby reduce the piston-applied pressure on the cavity upon reception of a deactivation signal, without requiring displacement of said piston;

sensing means for sensing when the machine is deactivated; and

signaling means for providing the signal to said pressure relief means when said sensing means determines that the machine is deactivated.

4,594,067

MOLD CLOSING DEVICE

Peter Langos, Siegburg, Fed. Rep. of Germany, assignor to Mauser-Werke GmbH, Bruhl, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,777

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416871

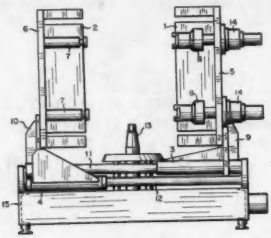
Int. Cl.[4] B29C *45/67*

U.S. Cl. 425—451.9 6 Claims

1. A mold closing system for a plastic fabricating machine by which at least one mold half is driven between an opened and a closed position and upon closing said mold half is releasably locked to the other mold half, said closing system comprising:

(a) a transport device for transporting said mold half, relatively toward the other mold half until there is a predetermined gap between the mold halves, and

(b) a separate locking means for moving said mold halves together to the fully closed and locked position by the



application of equal and opposite clamping forces operable independently of said transport device.

4,594,068

ROLL-FUSING APPARATUS

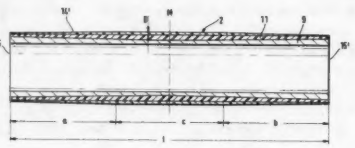
Bernd Bardutzky, Kriftel; Reinhard Dinges, Bad Soden am Taunus, and Peter Gumm, Glashütten, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,447

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 3323067

Int. Cl.⁴ B21B *31/08*

U.S. Cl. 432—60 **9 Claims**



1. A roll-fusing apparatus, comprising:

an internally heated fusing roller;

a pressure roller positioned adjacent to said fusing roller for fusing a toner image on a copy support which is conveyed between said rollers, said pressure roller comprising a radially symmetrical, non-cylindrical hollow roller core supported on a shaft, and a coating applied to the roller core, wherein the coating varies in thickness over the length of the roller core and has a complimentary configuration to the wall thickness of the core including a cylindrical outer configuration; and

a shrunk-on film tubing having a central zone with a uniform thickness and two end zones which are conically tapered toward the end faces of the pressure roller.

4,594,069

DENTAL CROWN REMOVER

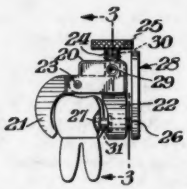
Benedict D. Thompson, 9008 Grape Creek Rd., Walkersville, Md. 21793

Filed Oct. 9, 1984, Ser. No. 658,527

Int. Cl.⁴ A61C *3/00*

U.S. Cl. 433—157 **9 Claims**

1. A dental crown remover comprising two arms extending and pivoting from an axis, said arms having means for firmly engaging a dental crown and having crown separating means rotatably attached to one of said arms for providing an outward force toward the circumference of the crown without substantially any compressive force wherein said rotatable separating means includes an elongated member for applying said outward force to the crown by rotation of said separating means, whereby upon rotation of said separating means said outward circumferential force causes an enlargement of the



circumference of said crown to allow the crown to separate from an underlying tooth.

4,594,070

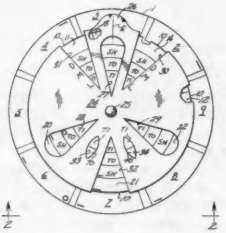
CALCULATOR FOR HARMONIZING COLORS

Elizabeth J. Stoddard, 267 Spyglass Dr., Eugene, Oreg. 97401

Filed May 24, 1984, Ser. No. 613,435

Int. Cl.⁴ G09F *9/00, 11/00*

U.S. Cl. 434—104 **5 Claims**



1. A calculator for selecting harmonizing colors, said calculator comprising,

a base having a multitude of basic color areas spaced about a base margin,

a rotatable circular member on said base and having differently colored sectors thereon defined by radii,

each color sector of the rotatable circular member including an outer marginal area constituting a true color area and additional radially orientated areas of each sector being a shade, a tone and a tint of a true color in said true color area,

a rotatable color selection guide on said circular member and including a pointer for disposition over a basic color on said base, said guide defining radially oriented windows through which true colors, shades, tones and tints of sectors on the rotatable circular member may be viewed and,

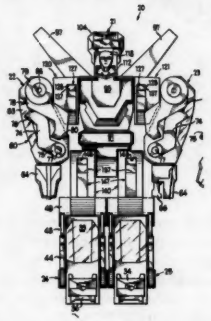
certain of said basic color areas on the base and certain of said true color and shade areas on the rotatable circular member having indices thereon, said indices indicating color incompatibility between said basic color, true color and shade areas when said pointer is disposed over a basic color on said base identified with said indices and said true color and shade areas on the rotatable member visible through said windows are also identified with said indices.

4,594,071

COMPOSITE TOY VEHICLE ASSEMBLY

John V. Zaruba; Patrick S. Baran, both of Chicago; Terry E. Webb, West Chicago, and Harry Disko, South Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 8, 1985, Ser. No. 699,831
Int. Cl.[4] A63H *3/16*
U.S. Cl. 446—99 13 Claims



1. A composite toy comprising:

first, second and third assemblies;

each of the assemblies having a body with a head attached for pivotal movement relative to the body;

a plurality of limbs attached to each body for pivotal movement relative to the body from an extended position in which the body is supportable on the limbs to a retracted position;

the retracted position for the limbs on the first assembly being substantially within a part of the first assembly;

an elongated appendage mounted on each body of the second and third assemblies for pivotal movement relative to the body; and

the elongated appendage of each of the second and third assemblies being insertable into the part of the first assembly adjacent a respective limb of the first assembly and being retained within the part of the first assembly by the respective limb of the first assembly being pivoted into the retracted position.

4,594,072

INFANT'S SOFT, SIMULATED AUTO DASHBOARD

Robert L. Cowell, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Continuation-in-part of Ser. No. 581,939, Feb. 21, 1984. This application Dec. 7, 1984, Ser. No. 679,659
Int. Cl.[4] A63H *17/00, 33/00*
U.S. Cl. 446—227 6 Claims

3. An infant's toy comprising:

first resilient member means for simulating an automobile dashboard and providing first soft, spongy member means for preventing injury to an infant, said first resilient member means having an upper surface, a lower surface and a cavity extending from said upper surface to a position above said lower surface;

a first soft cover encasing said first resilient member means;

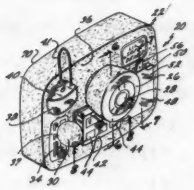
a coating of liquid impermeable material covering said first resilient member means, said coating being disposed between said first resilient member means and said first soft cover;

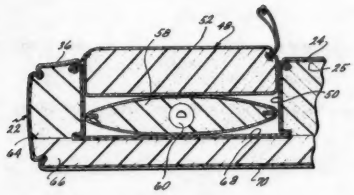
second resilient member means for simulating an automobile steering wheel and providing second soft, spongy member means for preventing injury to said infant, said second resilient member means being rotatably coupled to said first resilient member means adjacent said upper surface;

a second soft cover encasing said second resilient member means;

third resilient member means for simulating an automobile gear shift and providing third soft, spongy member means for preventing injury to said infant, said third resilient member means being coupled to said first soft cover adjacent said upper surface;

a third soft cover encasing said third resilient member means;





fourth resilient member means for removably closing said cavity and providing fourth soft, spongy member means for preventing injury to said infant, said fourth resilient member means being swingably coupled to said first soft cover adjacent said cavity and shaped to engage said cavity; and

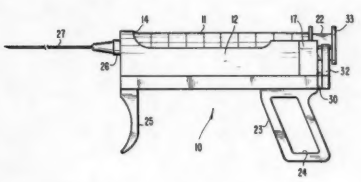
fifth resilient member means for simulating an automobile radio and providing fifth soft, spongy member means for preventing injury to said infant, said fifth resilient member means being attached to said first soft cover adjacent said upper surface.

4,594,073

ASPIRATION SYRINGE HOLDER

Charles R. Stine, 5779 Chipmunks Run, Apt. A, Indianapolis, Ind. 46254

Filed Oct. 31, 1984, Ser. No. 666,929
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—187 12 Claims



1. An aspiration device comprising:

a syringe of the disposable type having an open rear end, flanges extending transversely therefrom, a piston extending rearwardly from the open rear end of said syringe, said piston having a rear flange, and a needle removably attached to the front end of said syringe; and

an aspiration syringe holder for facilitating the use of said syringe in fine needle aspiration of tissue for cytological examination, said aspiration syringe holder comprising:

a syringe holder body having means for receiving and holding said disposable type syringe:

a handle affixed to said syringe holder body and extending outwardly therefrom proximate the rear end of said syringe, said handle having a rear surface configured for engagement with the palm of a human operator and arranged for applying to said syringe holder body forwardly directed force applied by said human operator to the rear surface of said handle, the rear surface of said handle being located forwardly of the rearwardmost excursion of the piston of said syringe;

a trigger extending outwardly from said syringe holder body forward of said handle;

means for maintaining said trigger in sliding engagement with said holder body such that said trigger is manually movable from a position proximate the front end of said syringe rearwardly toward the rear end of said syringe in sliding engagement with said syringe holder body; and

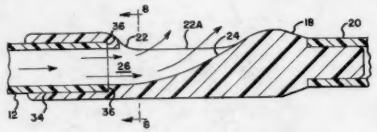
a linkage attached to said trigger and adapted and configured to engage the piston of said syringe for transmitting the rearward motion of said trigger to the piston, thereby moving the piston rearwardly with respect to said syringe.

4,594,074

NON-OCCLUDING HIGH FLOW ENTERAL FEEDING TUBE

Erik Andersen, Vernon Hills; Robert B. Edwards, II, Libertyville, and David G. Quinn, Grayslake, all of Ill., assignors to Viridian, Inc., Wheeling, Ill.

Filed May 6, 1985, Ser. No. 731,443
Int. Cl.[4] A61M *31/005*
U.S. Cl. 604—270 25 Claims



6. An enteral feeding tube for administration and aspiration of fluids within the gastrointestinal tract, the tube having a wall of selected thickness, a proximal end of the tube for joining to a fluid nutrient source, a distal end comprising:

a non-collapsible bolus, one end of the bolus being in fluid communication with the tube, the bolus having at least one opening defining a tube outlet, the bolus having a longitudinal passage placing the tube in fluid communication with the tube outlet, the bolus further including;

(a) side walls, a portion of the side walls being recessed and generally upwardly facing to define the opening, the recessed side wall portions having a transverse sectional height equal to at least one half the inner diameter of the tube; and,

(b) the longitudinal passage having an upwardly inclining floor, the floor narrowing the longitudinal passage toward the opening, the floor inclining upwardly from a proximal end of the passage and continuing until terminating proximate to a distal end of the passage,

whereby the recessed side walls and the upwardly inclining floor prevent occlusion of the tube outlet and permit fluid flow through the tube outlet substantially approximating an open-ended tube.

4,594,075

PROCESS FOR SPRAY-DRYING READILY WATER-SOLUBLE DYES AND FLUORESCENT BRIGHTENERS

Ernst Schenkenberger, Rheinfelden, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,392

Claims priority, application Switzerland, Jan. 24, 1984, 297/84

Int. Cl.[4] D06P *5/00*; C09B *67/06*; D06L *3/12*

U.S. Cl. 8—499 8 Claims

1. A process for obtaining a dried granulate of a readily water-soluble dye or fluorescent brightener which comprises spray drying a saturated aqueous slurry containing 20 to 60% by weight, based on the total weight of the spray slurry of a diluent-containing or diluent-free dye or brightener, wherein said dye or brightener is distributed between a dissolved and undissolved state in a ratio of said dissolved to undissolved state of 1:9 to 9:1.

4,594,076

METHOD AND COMPOSITION FOR REDUCING THE STRENGTH OF ICE

Robert J. Blake, Yorktown Heights, and Joseph E. Sokolik, Jr., Carmel, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 79,892, Sep. 28, 1979. This application Nov. 23, 1983, Ser. No. 554,818

Int. Cl.[4] C10L *9/10*

U.S. Cl. 44—6 6 Claims

1. A process for treating particulate coal which comprises applying to the coal surface up to about 0.5 weight percent, based upon the moisture content of the coal being treated, of a liquid aqueous solution consisting essentially of:

(1) from about 65 to about 95 weight percent of ethylene glycol;

(2) from about 1 to about 25 weight percent of at least one alkyl ether of a glycol derived from ethylene oxide containing from 1 to 6 oxyethylene units selected from one or more compounds having the formula:

$$HO—CH_2-(CH_2—O)_nR$$

wherein:

R is alkyl containing 1 to 2 carbon atoms; and

n is an integer of 1 to 6; and

(3) up to about 30 weight percent water.

4,594,077

FUEL COMPOSITIONS

Edward F. Zaweski, and Leonard M. Niebylski, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 20, 1985, Ser. No. 778,016

Int. Cl.[4] C10L *1/18*

U.S. Cl. 44—57 14 Claims

1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (i) organic nitrate ignition accelerator, and (ii) 1,3,5-trimethyl-2,4,6-tris(3,5-dialkyl-4-hydroxybenzyl)benzene, said combination being present in an amount sufficient to minimize the coking characteristics of such fuel, especially throttling nozzle coking in the prechambers or swirl chambers of indirect injection compression ignition engines operated on such fuel.

4,594,078

CONTINUOUS DIGESTER OF THE PRODUCTION OF BIOMETHANE FOR ORGANIC SUBSTANCES

Maurice Guerin, 53 Rue Victor Hugo, 71000 Macon, and Patricia Ribaud, 20, Rue Emile Dubois, 75014 Paris, both of France

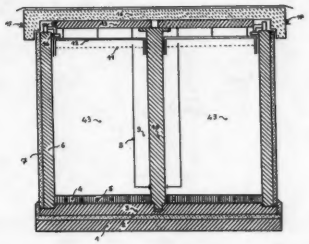
PCT No. PCT/FR83/00244, § 371 Date Jul. 27, 1984, § 102(e) Date Jul. 27, 1984, PCT Pub. No. WO84/02349, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 7, 1983, Ser. No. 638,459

Claims priority, application France, Dec. 8, 1982, 82 20809

Int. Cl.[4] C12M *1/02*

U.S. Cl. 48—111 6 Claims



1. An apparatus for the production of biomethane from organic substances, said apparatus comprising

(A) a digester having a vat with product inlet channel means for feeding organic substances thereto and a centrally located vertical axis, wherein the vat is formed by a fixed foundation, a floor and vertical side walls secured to the foundation;

(B) a central support pillar having a central vertical axis coincident with the vertical axis of the vat, wherein the support pillar is movably joined to the foundation so that the pillar can rotate about the axis;

(C) an upper portion covering the vat, wherein the upper portion is fixed to the central pillar and rotatably supported on the side walls so that the pillar and the upper portion can rotate about the central vertical axis;

(D) a cylindrical primary compartment having an open top and a bottom, said primary compartment being located inside the vat and spaced from the side walls of the vat forming a secondary compartment thereinbetween, wherein the primary compartment surrounds the central pillar and has a vertical axis that is coincident with the central vertical axis of the pillar;

(E) a fixed vertical partition joined to the floor and radially extending across and substantially blocking a cross-section of the secondary compartment;

(F) a movable partition having an upper part and a lower part, said movable partition radially extending across the secondary compartment, wherein said movable partition is capable of moving about the central vertical axis with the upper portion and the central pillar to displace all substances in the secondary compartment located on either side of the fixed partition by alternate movement in one direction and then in the opposite direction;

(G) recirculating pump means and feed pump means fixed to the upper part of the movable partition;

(H) conduit means connected to said recirculating pump for transferring from one side of the movable partition to an opposite side of the movable partition all of the substances in the secondary compartment that are displaced when the movable partition moves about the central vertical axis;

(I) conduit means connected to said feed pump for transferring substances from the bottom of the primary compartment alternately (1) to the top of the primary compartment, and (2) to the secondary compartment; and

(J) flexible tank means fixed to the upper portion for collecting biogas formed in the digester.

4,594,079

GAS SEPARATING MEMBER AND METHOD FOR MANUFACTURE THEREOF

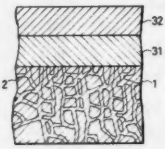
Minoru Yamamoto, and Jiro Sakata, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Dec. 17, 1984, Ser. No. 682,145

Claims priority, application Japan, Dec. 23, 1983, 58-243600

Int. Cl.⁴ B01D *53/22*

U.S. Cl. 55—158 **14 Claims**



1. A gas separating member, comprising:

a porous substrate and a polymer film deposited by plasma polymerization on a surface of said substrate, said film comprising at least two layer parts, namely, a first layer part contiguous with said substrate and a second layer part superimposed on said first layer part, said first layer part being a plasma polymerization product of a first organic monomer and having a substantially uniform chemical composition in the direction of film thickness and said second layer part being a plasma polymerization product of said first organic monomer and at least one additional organic monomer, the amount of said first organic monomer being gradually decreased and that of said additional organic monomer being gradually increased, and thus having a chemical composition which changes substantially continuously in the direction of film thickness.

8. A method for manufacturing a gas separating member, comprising the steps of:

depositing a first organic monomer on a surface of a porous substrate by plasma polymerization, thereby to form a first layer part of a polymer film, said first layer part having a substantially uniform chemical composition in the direction of film thickness, then depositing said first organic monomer and at least one additional organic monomer on a surface of said first layer part by plasma polymerization while changing the mixing ratio of said first organic monomer and said additional organic monomer by gradually decreasing the amount of said first organic monomer and gradually increasing the amount of said additional organic monomer, thereby to form a second layer part of said polymer film, said second layer part having a chemical composition varying substantially continuously in the direction of film thickness.

4,594,080

MOLECULAR SIEVE TYPE GAS SEPARATION SYSTEMS

J. Keith Tremain, and James C. Taylor, both of Yeovil, England, assignors to Normalair-Garrett Holdings Ltd., Yeovil, England

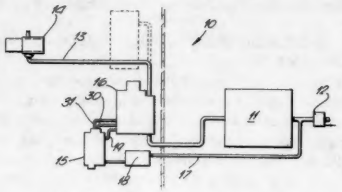
Filed Feb. 19, 1985, Ser. No. 702,738

Claims priority, application United Kingdom, Feb. 20, 1984, 8408887

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—179 **10 Claims**

1. Apparatus for controlling the concentration of a constituent gas in a product gas delivered by a molecular sieve type gas separation system including a concentrator having two or more adsorption beds arranged for receiving pressurised supply gas and delivering product gas by way of a delivery duct to an outlet, the apparatus comprising a flueric partial pressure sensor, arranged to compare a reference bleed of the supply gas with a sample bleed of the product gas, having signal



outlets connected to control means of an operably associated spill-valve, the spill-valve being arranged for conduit connection to the delivery duct so that the rate of flow of gas through the adsorption beds may be controlled by spilling product gas from the delivery duct, thereby controlling the concentration of the constituent gas in the product gas.

4,594,081

GAS SCRUBBER

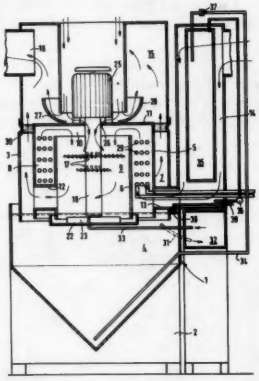
Walter Kroll, Wilhelm -Busch-Strasse 13, D-7510 Backnang, and Paul Christian, Bad Friedrichshall-Untergriesheim, both of Fed. Rep. of Germany, assignors to Walter Kroll, Backnang, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,126

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1983, 3303874; Jul. 5, 1983, 3324124; Jul. 5, 1983, 3324123

Int. Cl.⁴ B01F *3/04*

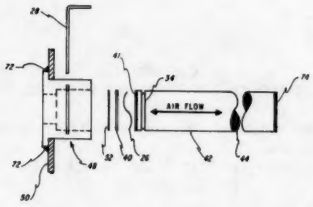
U.S. Cl. 55—222 **14 Claims**



1. A gas scrubber, comprising a processing chamber having a gas feeding area; and at least one spraying device positioned in said chamber and including a rotary hollow shaft having a vertical central axis, and a disc arrangement having discs mounted on said shaft to rotate therewith about said axis, said shaft having openings formed adjacent to each disc, said discs being coated with a cleaning liquid passing through said shaft and said openings and adhering to the discs and sprayed from said discs under the action of centrifugal forces outwardly in the form of an annular spray zone, each disc having perforations and being formed at a periphery thereof with recesses forming aerodynamically operating elements, said recesses being formed by cutouts at said periphery, said elements being

formed as blades twisted at an adjusted angle relative to a plane of the disc so that gas being cleaned upon the rotation of said discs is forced radially outwardly and also axially of said disc arrangement away from said gas feeding area.

4,594,082
DEHYDRATING AIR-FILTERING APPARATUS
Robert Catherwood, Sr., Honeoye Falls, N.Y., assignor to Harris Corporation, Melbourne, Fla.
Filed Nov. 19, 1984, Ser. No. 672,547
Int. Cl.[4] B01D *53/02*
U.S. Cl. 55—316 **19 Claims**



1. A dehydrating air-filtering apparatus for radio frequency communications equipment contained within a sealed enclosure comprising:

means defining an aperture formed in one of the sides of the enclosure, other than the top side;

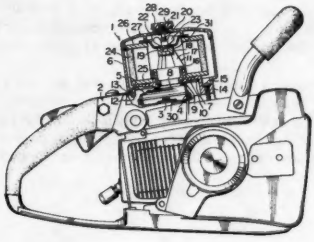
a screen having a mesh size that is adapted to condense moisture contained in the air flow there through;

a container having a dehydrating material therein, being formed to allow air passage through said dehydrating material; and

mounting means for detachably securing said screen and container to said enclosure in a series arrangement with said aperture for providing a controlled path for air flow into and out of said enclosure serially through said screen and said dehydrating material, and with said container extending within said enclosure, said screen being positioned adjacent to said aperture so that any condensed moisture formed on said screen tends to flow off said screen and exterior to said enclosure, wherein said filtering apparatus removes moisture from the air passing into the enclosure through the controlled path.

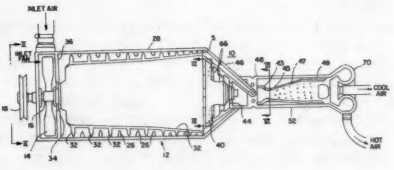
4,594,083
AIR CLEANER
Junichi Hiraizumi, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan
Filed Feb. 13, 1985, Ser. No. 701,175
Claims priority, application Japan, Feb. 20, 1984, 59-21758[U]
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—385 BR **1 Claim**

1. An air cleaner in which a case member having therein an filter element and an air intake pipe retainer is mounted on a power machine body and is communicated with an engine carburetor in the body for supplying clean air to the carburetor, said air cleaner characterized in that an end of a flexible air intake pipe is mounted on a receiving member sealingly surrounding an intakeport of the carburetor, the other end of the air intake pipe is clamped by an end portion of the air intake pipe retainer engaging with a bottom opening of the case member, a retaining claw for engaging with a frame edge of the body is formed at a bottom portion of the case member, and



said bottom portion of said case member is fastened by a screw at a position remote from said retaining claw.

4,594,084
AIR CONDITIONING SYSTEM
Wallace Lopez, Albuquerque, N. Mex., assignor to Astri Corporation, Albuquerque, N. Mex.
Filed Jul. 15, 1985, Ser. No. 754,913
Int. Cl.[4] F25B *9/02*
U.S. Cl. 62—5 **6 Claims**



1. Apparatus for converting a first gas stream having a superatmospheric pressure into a hot gas product stream and a cool gas product stream which comprises a plurality of slightly subsonic nozzles having first inlet means for introducing said first gas stream into said nozzles, said nozzles having exit means for introducing gas from said nozzles tangentially into a cylindrical tube, said cylindrical tube having a second gas inlet means and a second gas outlet means, said cylindrical tube having a first section with walls converging toward the axis of said cylindrical tube, a short stabilizing section contiguous to said first section and having walls generally parallel to the axis of said clyindrical tube, a second section contiguous to said stabilizing section and having walls diverging away from the axis of said cylindrical tube and a long stabilizing section contiguous to said second section and in fluid communication with said second gas outlet means, said long stabilizing section having walls generally parallel to the axis of said cylindrical tube, means for separating a hot gas product stream in the long stabilizing section located in a radially outer position of the long stabilizing section from a cool gas product stream located in a radially inner portion of the long stabilizing section and means for recovering said hot gas product stream separately from said cool gas product stream.

4,594,085
HYBRID NITROGEN GENERATOR WITH AUXILIARY REBOILER DRIVE
Harry Cheung, Kenmore, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.
Filed Nov. 15, 1984, Ser. No. 671,939
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—25 **13 Claims**

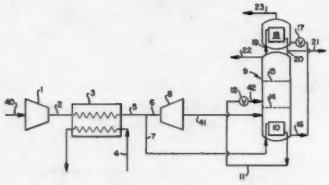
1. A process for the production of nitrogen at relatively high

yield and purity by cryogenic rectification of feed air comprising avoiding the need to employ a nitrogen recycle stream by the steps of:

(a) introducing the major portion of the feed air into a rectification column which is operating at a pressure in the range of from 35 to 145 psia, and wherein feed air is separated into nitrogen-rich vapor and oxygen-enriched liquid;

(b) condensing a minor portion of the feed air, at a pressure greater than that at which the column is operating, by indirect heat exchange with oxygen-enriched liquid;

(c) introducing the resulting condensed minor portion of the feed air into the column at a point at least one tray above



the point where the major portion of the feed air is introduced into the column;

(d) condensing a first portion of the nitrogen-rich vapor by indirect heat exchange with vaporizing oxygen-enriched liquid;

(e) passing at least some of the resulting condensed nitrogen-rich portion to the column at a point at least one tray above the point where the minor portion of the feed air is introduced into the column; and

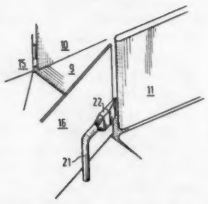
(f) recovering substantially the entire remaining second portion of the nitrogen-rich vapor as product nitrogen precluding the need for substantial recycle of any portion thereof back to the distillation column.

4,594,086

METHOD AND APPARATUS FOR DISTRIBUTION OF FIBRES IN A FELT

Francis Mosnier, Coye la Foret, France, assignor to Isover Saint-Gobain, Aubervilliers, France

Filed Feb. 27, 1984, Ser. No. 583,608
Int. Cl.[4] C03B *37/05, 37/06*
U.S. Cl. 65—4.4 **8 Claims**



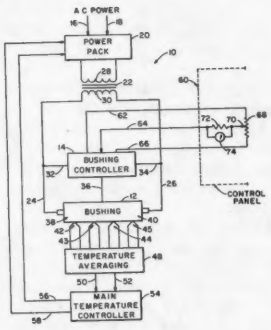
1. Process for the formation of a felt of fibres, in which the fibres are formed from a material in an attenuable state, this material being conducted to the peripheral surface of one or more than one wheel subjected to a movement of rotation, from which the fibres become detached to be projected into a gas current directed transversely to the direction of projection of the fibres along the peripheral wall of the wheel or wheels, the fibres thus formed, entrained by the gas current, being conducted into a receiving chamber in which a perforated conveyor constitutes the base thereof, the gas current carrying the fibres passing through the conveyor and the fibres being deposited on the conveyor to form the felt, which process is characterised in that one or more additional gas jets are produced on each side of the gas current carrying fibers, substantially in the same direction as the said current, these additional jets being emitted along the side walls bordering the perforated conveyor, the mass of additional gas introduced being regulated separately on each side as a function of the correction in distribution to be produced, the transverse distribution of the fibres in the felt being controlled continuously, the measurements carried out being analyzed and compared with the required values in a computer producing responses in the form of a command for controlling the means regulating the emission of additional gas.

4,594,087

THREE-TERMINAL CONTROLLER FOR FIBER GLASS BUSHING

John J. Kuhn, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 1, 1985, Ser. No. 718,609
Int. Cl.[4] C03B *37/07*
U.S. Cl. 65—1 **11 Claims**



9. In combination, a fiber glass bushing having a power control circuit including a power transformer having a secondary winding connected across the bushing, a power pack connected to the primary winding of the power transformer, a temperature controller responsive to the temperature of the bushing and connected to the power pack, and a bushing controller for controlling the relative temperatures of sections of the bushing, the bushing controller comprising:

first and second controllable impedance devices connected in series across the bushing and across the secondary winding of the power transformer;

current bypass means connected between the junction of said first and second controllable impedance devices and an intermediate tap on the bushing, said intermediate tap defining first and second sections of the bushing, whereby each of said first and second controllable impedance devices is connected across a corresponding, one of said first and second bushing sections;

set point controller means; and

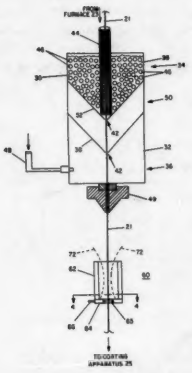
circuit means responsive to said set point controller means to activate one or the other of said first and second controllable impedance devices to shunt current around its corresponding bushing section to thereby control the relative current flow in the bushing sections.

4,594,088

METHOD AND APPARATUS FOR MAKING, COATING AND COOLING LIGHTGUIDE FIBER

Un-Chul Paek, West Windsor Township, Mercer County, and Charles M. Schroeder, North Hanover Township, Burlington County, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed May 28, 1985, Ser. No. 737,988
Int. Cl.[4] C03C *25/02;* C03B *37/025*
U.S. Cl. 65—3.4 14 Claims



1. A method of fabricating a lightguide fiber, comprising the steps of:

drawing the fiber from a heated lightguide preform;

moving the fiber into a cooling liquid in an upper chamber having an aperture in the lower portion thereof; and

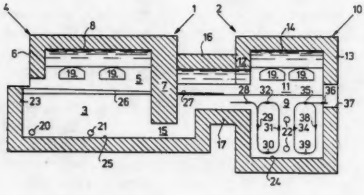
further moving the fiber, cooled by the liquid, through in a non-contact manner the aperture into a lower chamber pressurized with a gas pressure sufficient to substantially prevent liquid from passing through the aperture.

4,594,089

METHOD OF MANUFACTURING GLASS

Motoharu Kurata, Tokyo, Japan, assignor to Asahi Glass Co. Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,894
Claims priority, application United Kingdom, Jan. 28, 1984, 8402298
Int. Cl.[4] C03B *5/22*
U.S. Cl. 65—135 25 Claims



1. A method of manufacturing glass in which raw material is fed as a batch to a continuous glass-melting tank furnace which includes a melting chamber, a separate refining chamber having an upstream end, and means including a rising passageway and a sill at the upstream end of the refining chamber for communicating molten glass between the chambers, comprising: melting the batch in a melting zone disposed in said melting chamber; passing the molten glass to a refinement zone disposed in said refining chamber for refinement therein in an atmosphere isolated from that of said melting chamber, by permitting the molten glass to flow from the melting chamber to the refining chamber via the rising passageway and over the sill at the upstream end of the refining chamber; and heating the glass at the upstream end of the refining chamber to a higher temperature than that of the glass over the sill so that glass leaving the sill plunges in the refining chamber and glass in that chamber is precluded from forming a return current to the melting chamber.

4,594,090

HIGH NUTRIENT CONTENT FERTILIZERS

Wallace Johnson, Geraldine, Mont. 59446

Filed Oct. 15, 1985, Ser. No. 786,996
Int. Cl.[4] C05B *15/00;* C05C *9/00*
U.S. Cl. 71—29 16 Claims

1. A method of producing a stable acidic liquid fertilizer containing N, P_2O_5 and S in a total concentration of at least about 28% and having a salt-out temperature below about 0° F. comprising:

A. mixing an aqueous solution of sulfuric acid with diammonium phosphate, said aqueous solution containing sulfuric acid in a concentration from about 10% to about 16% by weight, and said diammonium phosphate being present in amount from about 3 grams to about 5 grams per gram of sulfuric acid; and

B. mixing urea with the reaction products of said aqueous solution of sulfuric acid and said diammonium phosphate, said urea being provided in amount from about 7 grams to about 10 grams per gram of sulfuric acid which had been mixed with diammonium phosphate in step A.

4,594,091

BORATE ALGAECIDE AND FUNGICIDE

John W. Girvan, 5295-6 Western Way Cir., Jacksonville, Fla. 32216

Filed Feb. 23, 1984, Ser. No. 583,014
Int. Cl.[4] A01N *59/14*
U.S. Cl. 71—67 3 Claims

1. A method for controlling algae growth in swimming pool water comprising adding to said water an effective amount of derivatives of boron selected from the group consisting of sodium tetraborate and potassium tetraborate.

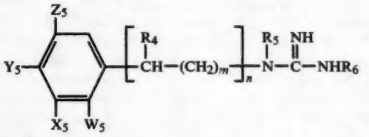
4,594,092

SUBSTITUTED NITRO AND CYANOGUANIDINES AND THEIR USE OF INCREASING CROP YIELDS

Laurine M. Speltz, Princeton; Bryant L. Walworth, Pennington, and Alexander D. Pavlista, Lawrenceville, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 451,698, Dec. 20, 1982, abandoned. This application Nov. 17, 1983, Ser. No. 551,611
Int. Cl.[4] A01N *31/08, 31/14, 37/34, 33/18*
U.S. Cl. 71—77 26 Claims

1. A method for inducing a cytokinin-like response in ornamental and crop plants, said method comprising: applying to the foliage of said plants or to soil containing seeds or other propagating organs thereof, a cytokinin-like-response-inducing amount of a compound represented by the structural formula,



(V)

wherein W_5 is H, F or Cl; X_5 is H, straight or branched C_1–C_4 alkyl, halogen, CN, NO_2, $CH_2CN.OCHF_2$, OCF_2CHF_2,

OCF_3, CF_3, C_1–C_4 alkoxy, OH, $C(OH)_2CF_3$, $COCH_3$, $N(CH_3)_2$, or CH_2OR_3 where R_3 is H or CH_3; Y_5 is H, OH, OCH_3, CH_3 or halogen; Z_5 is H, CH_3, halogen, OCH_3 or CF_3; R_4 is H, $CH_3C_2H_5$ of CF_3; R_5 is H or CH_3; R_6 is NO_2 or CN; m is an integer of 0, 1 or 2; n is an integer of 0 or 1; and the salts or tautomers thereof.

4,594,093

TRIESTER DERIVATIVES OF N-PHOSPHONOMETHYLTHIONOGLYCINE AS HERBICIDES

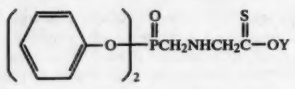
James A. Sikorski, Kirkwood, and David E. Schafer, St. Louis, both of Mo., assignors to Monsanto Co., St. Louis, Mo.

Filed Nov. 26, 1984, Ser. No. 674,634

Int. Cl.[4] A01N *57/10;* **C07C** *153/023*

U.S. Cl. 71—87 **20 Claims**

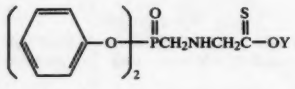
1. A compound represented by the formula



I

wherein Y is an alkyl group containing 2–6 carbon atoms and the strong acid salts of such compounds.

15. A method of controlling undesired plants which comprises applying to said plants a herbicidally effective amount of a compound of the formula



I

wherein Y is an alkyl group containing 2–6 carbon atoms and the strong acid salts of such compounds.

4,594,094

OXACYCLOALKANE-ALPHA-(THIO)CARBOXYLIC ACID DERIVATIVES AND USE AS PLANT GROWTH REGULATORS AND HERBICIDES

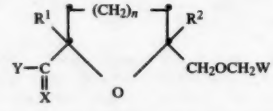
Willy D. Kollmeyer, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 4, 1983, Ser. No. 482,371

Int. Cl.[4] A01N *43/08;* **C07D** *307/04, 405/12*

U.S. Cl. 71—88 **10 Claims**

1. A (thio)carboxylic acid derivative of the formula



wherein R^1 and R^2 each independently is a hydrogen atom or an optionally-substituted alkyl group containing from 1 to 6 carbon atoms; n is 0 or 1; X is O or S and Y is NR^4R^5 or when X is O then Y is also OH or OR^3 in which R^3, R^4 and R^5 is independently a hydrogen atom or an optionally-substituted alkyl, alkenyl, alkynyl, cycloalkyl, aryl or aralkyl group containing up to 10 carbon atoms; and W is an optionally substituted unsaturated group containing up to 4 carbon atoms, a cycloalkyl group containing 3 to 10 carbon atoms, a secondary alkyl group containing 3 to 10 carbon atoms, an aromatic group containing up to 14 carbon atoms or a heterocyclic group containing up to 14 carbon atoms, in which the optional substituents for R^1, R^2, R^3, R^4, R^5 and W are halogen atoms of atomic number 9 to 35, inclusive, ior alkyl, alkoxy or alkylthio groups containing 1 to 4 carbon atoms, each optionally substituted by one or more halogen atoms.

9. A method of regulating plant growth at a locus comprises applying to the locus or the plant an effective amount of an active ingredient of a compound according to claim 1 in which Y is NR^4R^5 or when X is O then Y is also OR^3.

4,594,095

BIOCIDAL AZOLYL-PROPANE NITRILES

Carlo Skötsch; Dietrich Baumert, and Hansjörg Krähmer, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

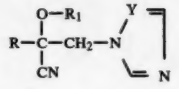
Filed Aug. 10, 1984, Ser. No. 640,156

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3329213

Int. Cl.[4] A01N *43/50, 43/653;* **C07D** *233/61, 249/08*

U.S. Cl. 71—92 **12 Claims**

1. Azolyl-propanenitrile of the formula



I

in which

R is phenyl, methylphenyl, fluorophenyl, chlorophenyl or dichlorophenyl,

R_1 is cyclopentyl or cyclohexyl, and

Y is N or CH, or a salt thereof with nitric acid.

9. A fungicidal, plant growth regulating and bactericidal composition comprising from 10 to 90 percent by weight of at least one compound according to claim 1 in mixture with a carrier material, with or without an adjuvant.

4,594,096

PLANT PROTECTION AGENTS IN THE FORM OF MIXED DISPERSIONS

Konrad Albrecht, Kelkheim, and Gerhard Frisch, Wehrheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 24, 1984, Ser. No. 573,402

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302648

Int. Cl.[4] A01N *25/02*

U.S. Cl. 71—93 **5 Claims**

1. A liquid stabilized pesticidal agent, which comprises a mixture of

an active compound concentrate containing as the active ingredient one or more pesticidal compounds melting at a temperature below 70° C., said active compound concentrate containing 5 to 50% by weight of active ingredient, and as a solvent one or more dialkyl phthalates, each said alkyl being of from 4 to 8 carbon atoms, and

an aqueous suspension concentrate containing as the active ingredient one or more pesticidal compounds melting above 70° C., said suspension concentrate containing 5 to 55% by weight of active ingredient, 2–30% by weight of a dispersing agent, an alkali metal salt of a sulfosuccinic acid half-ester, an alkali metal ligninsulfonate or a condensation product of formaldehyde and a cresol, 0.5 to 8% by weight of a wetting agent, an alkali metal salt of a phosphate partial ester of an alkyl polyglycol ester, which contains of from 2 to 20 ethylene oxide units and the alkyl of which is of from 6 to 24 carbon atoms, and 0.1 to 5% by weight of a thickener, a mixture of equal parts of an alkali metal ligninsulfonate and a swellable alkaline earth metal silicate, 10 to 80% by weight of phthalic acid ester, and 2 to 20% by weight of an emulsifying agent,

the ratio of the amount of the active compound concentrate to the amount of the aqueous suspension concentrate being of from 0.1:5 to 5:0.1.

4,594,097

N-PHENYLSULFONYL-N'-TRIAZINYLUREAS

Rolf Schurter, Binningen; Werner Föry, Basel, and Willy Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

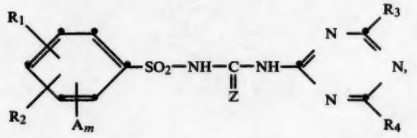
Division of Ser. No. 496,326, May 19, 1983, Pat. No. 4,537,618. This application Jun. 17, 1985, Ser. No. 745,749

Claims priority, application Switzerland, May 26, 1982, 3232/82

Int. Cl.[4] C07D *251/50, 251/52, 401/12;* A01N *43/70*

U.S. Cl. 71—93 14 Claims

1. N-phenylsulfonyl-N'-triazinylurea of the formula



wherein

A is a radical of the formula —C≡C—R,

m is 1 or 2,

Z is oxygen or sulfur,

R is hydrogen; branched or unbranched C_1–C_9alkyl which is unsubstituted or substituted by halogen, hydroxyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4haloalkoxy, C_3–C_9cycloalkyl, cyano, —$COOR_6$, —$CONR_7R_8$ or by phenyl which is in turn unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, nitro, cyano or trifluoromethyl; or is C_3–C_9cycloalkyl which is unsubstituted or substituted by halogen, hydroxyl, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, cyano, —$COOR_6$, —$CONR_7R_8$; or is phenyl or phenyl substituted by halogen, nitro, cyano, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, trifluoromethyl, —$COOR_6$ or —$CONR_7R_8$; or is a 5- or 6-membered heterocyclic ring selected from the group consisting of furan, thiophene, pyrrole, pyrazole, triazole, pyridine, pyrimidine, pyridazine, triazine, thiazole, oxazole, thiadiazole and oxadiazole, which is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, —$COOR_6$ or —$CONR_7R_8$,

R_1 is hydrogen, halogen, C_1–C_5alkyl, C_2–C_5alkyl, C_2–C_5alkenyl or a radical —Y—R_5,

R_2 is hydrogen, halogen, C_1–C_5alkyl, C_2–C_5alkenyl, C_1–C_4haloalkyl, or a radical —Y—R_5, —$COOR_6$, —NO_2 or —CO—NR_7—R_8,

R_3 and R_4, each independently of the other, are hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4haloalkyl, C_1–C_4haloalkoxy, C_1–C_4haloalkylthio, halogen, C_2–C_5alkoxyalkyl, —NR_9R_{10} or —O—CH_2—CH_2—NR_9R_{10},

R_5 and R_6, each independently of the other, are C_1–C_5alkyl, C_2–C_5alkenyl or C_2–C_6alkynyl, C_1–C_5haloalkyl, C_2–C_5haloalkenyl or C_2–C_6alkoxyalkyl,

R_7 and R_8, each independently of the other, are hydrogen, C_1–C_5alkyl, C_2–C_5alkenyl or C_2–C_6alkynyl,

R_9 is hydrogen, methyl or ethyl,

R_{10} is hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, methoxymethyl, cyanomethyl, cyanoethyl, C_3–C_5alkenyl or C_3–C_6alkynyl, and

Y is oxygen, sulfur, a sulfinyl or sulfonyl bridge, or a salt thereof.

4,594,098

PHOSPHORUS-CONTAINING FUNCTIONAL DERIVATIVES OF ACETIC ACID, PROCESS FOR THEIR PREPARATION AND HERBICIDAL AND GROWTH-REGULATING AGENTS CONTAINING THEM

Klaus Bauer, Rodgau; Hermann Bieringer, Eppstein; Helmut Bürstell, Frankfurt am Main, and Jean Kocur, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

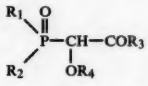
Continuation of Ser. No. 530,196, Sep. 7, 1983. This application Jul. 16, 1985, Ser. No. 755,546

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233603; Oct. 21, 1982, 3238958

Int. Cl.[4] A01N *57/22, 57/20;* C07C *69/675*

U.S. Cl. 71—86 13 Claims

1. A compound of the formula



and salts thereof with bases and acids in which

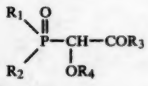
R_1 is C_1 or C_2-alkyl and R_2 is C_1-alkyl;

R_3 is —OH, (C_1–C_{12})-alkoxy, (C_3–C_8)-cycloalkoxy, (C_3–C_6)-alkenyloxy, (C_3–C_6)-alkynyloxy, phenoxy or benzyloxy, it being possible for the groups mentioned in turn to be substituted by OH, halogen, CF_3, (C_1–C_4)-alkyl or (C_1–C_4)-alkoxy, or R_3 is hydrazino;

R_4 is H, (C_1–C_6)-alkyl, allyl, propargyl, benzyl, halogenobenzyl or $CONR_4R_6$;

R_5 and R_6 independently of one another are hydrogen, (C_1–C_{12})-alkyl, (C_3–C_8)-cycloalkyl, (C_3–C_6)-alkenyl, (C_3–C_6)-alkynyl, phenyl, benzyl, benzoyl, phenoxysulfonyl, (C_1–C_{12})-alkylsulfonyl, (C_3–C_6)-alkenylsulfonyl or phenylsulfonyl, it being possible for the groups mentioned in turn to be substituted by halogen, CF_3, CN, (C_1–C_4)-alkoxy or (C_1–C_4)-alkoxycarbonyl.

8. A herbicidal and growth-regulating agent which contains a compound of the formula:



and salts thereof with bases and acids in which

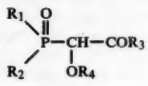
R_1 and R_2 independently of one another are C_1 or C_2-alkyl;

R_3 is —OH, (C_1–C_{12})-alkoxy, (C_3–C_8)-cycloalkoxy, (C_3–C_6)-alkenyloxy, (C_3–C_6)-alkynyloxy, phenoxy or benzyloxy, it being possible for the groups mentioned in turn to be substituted by OH, halogen, CF_3, (C_1–C_4)-alkyl or (C_1–C_4)-alkoxy, or R_3 is hydrazino;

R_4 is H, (C_1–C_6)-alkyl, allyl, propargyl, benzyl, halogenobenzyl or $CONR_5R_6$;

R_5 and R_6 independently of one another are hydrogen, (C_1–C_{12})-alkyl, (C_3–C_8)-cycloalkyl, (C_3–C_6)-alkenyl, (C_3–C_6)-alkynyl, phenyl, benzyl, benzoyl, phenoxysulfonyl, (C_1–C_{12})-alkylsulfonyl, (C_3–C_6)-alkenylsulfonyl or phenylsulfonyl, it being possible for the groups mentioned in turn to be substituted by halogen, CF_3, CN, (C_1–C_4)-alkoxy or (C_1–C_4)-alkoxycarbonyl with a carrier therefor.

9. A method for combating undesirable plant growth, which comprises treating affected areas with an effective amount of a compound of the formula



and salts thereof with bases and acids in which

R_1 and R_2 independently of one another are C_1 or C_2-alkyl;

R_3 is —OH, (C_1–C_{12})-alkoxy, (C_3–C_8)-cycloalkoxy, (C_3–C_6)-alkenyloxy, (C_3–C_6)-alkynyloxy, phenoxy or benzyloxy, it being possible for the groups mentioned in turn to be substituted by OH, halogen, CF_3, (C_1–C_4)-alkyl or (C_1–C_4)-alkoxy, or R_3 is hydrazino;

R_4 is H, (C_1–C_6)-alkyl, allyl, propargyl, benzyl, halogenobenzyl or $CONR_5R_6$;

R_5 and R_6 independently of one another are hydrogen, (C_1–C_{12})-alkyl, (C_3–C_8)-cycloalkyl, (C_3–C_6)-alkenyl, (C_3–C_6)-alkynyl, phenyl, benzyl, benzoyl, phenoxysulfonyl, (C_1–C_{12})-alkylsulfonyl, (C_3–C_6)-alkenylsulfonyl or phenylsulfonyl, it being possible for the groups mentioned in turn to be substituted by halogen, CF_3, CN, (C_1–C_4)-alkoxy or (C_1–C_4)-alkoxycarbonyl.

4,594,099

N-SUBSTITUTED-Δ^1-TETRAHYDROPHTHALIMIDE DERIVATIVES

Osamu Yamada, Ageo; Mikio Yanagi, Okegawa; Fumio Futatsuya, Ohmiya, and Kenji Kobayashi, Okegawa, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

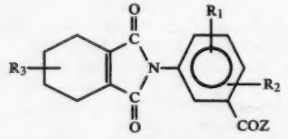
Continuation of Ser. No. 241,021, Mar. 6, 1982, abandoned. This application Oct. 11, 1983, Ser. No. 540,691

Claims priority, application Japan, Mar. 12, 1980, 55-30267; Dec. 24, 1980, 55-181850

Int. Cl.[4] A01N *43/38*; C07D *209/48*

U.S. Cl. 71—96 **28 Claims**

21. A herbicidal composition comprising 0.1 to 95% by weight of a new N-substituted-Δ^1-tetrahydrophthalimide derivative represented by the formula:



(I)

wherein R_1 is hydrogen, halogen, lower alkyl, lower alkoxy or nitro, R_2 is hydrogen, lower alkyl or halogen, R_3 is hydrogen or lower alkyl and Z is hydroxy, straight or branched chain C_1–C_8 alkoxy that may have halogen, lower alkoxy, lower alkoxyalkoxy or cyano as substitution groups, alicyclic alkoxy, alkenyloxy, alkynyloxy, phenoxy that may have halogen, lower alkyl or lower alkoxy as substitution groups, aralkyloxy that may have halogen, lower alkyl or lower alkoxy as substitution groups, alkylthio, amino, primary or secondary alkylamino that may have halogen and hydroxy as substitution groups, alkenylamino that may have halogen as substitution groups, morpholino that may have lower alkyl as substitution groups or metal salt of hydroxy provided that when R_1, R_2 and R_3 are hydrogen, Z is not hydroxyl and 5 to 99.9% by weight of adjuvants.

4,594,100

HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

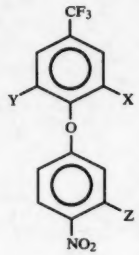
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 939,086, Sep. 1, 1978, Pat. No. 4,350,522, which is a division of Ser. No. 808,415, Jun. 20, 1977, Pat. No. 4,185,995, which is a division of Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,046,798, which is a division of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, and a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. This application Sep. 16, 1981, Ser. No. 302,948

Int. Cl.[4] A01N *31/14*

U.S. Cl. 71—124 **10 Claims**

1. A herbicidal composition comprising an effective amount of a compound of the formula



wherein

X is a hydrogen atom, a halogen atom, a trifluoromethyl group, or a (C_1–C_4)alkyl group,

Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

Z is a (C_1–C_4)alkyl group or a halogen atom,

and an agromically acceptable carrier.

4,594,101

FINE COMPOSITE POWDER MATERIAL AND METHOD AND APPARATUS FOR MAKING THE SAME

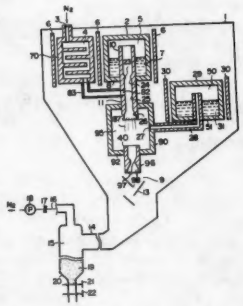
Hirohisa Miura; Hiroshi Sato; Toshio Natsume, and Hidenori Katagiri, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 8, 1984, Ser. No. 608,167

Claims priority, application Japan, May 10, 1983, 58-81534

Int. Cl.[4] B22F *9/00*

U.S. Cl. 75—0.5 C **14 Claims**



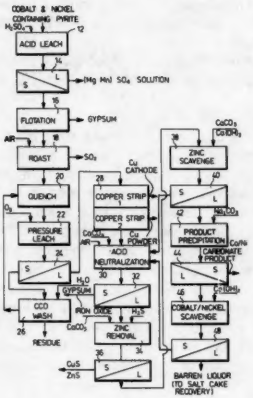
1. A composite fine powder material, comprising first particles with average particle diameter less than or equal to about ten microns, each having a composite structure and comprising

a plurality of fine second particles of a ceramic formed from a first metal combined with a gas and substantially uniformly dispersed and embedded in a matrix of a second metal, produced by first mixing vapor of said first metal with said gas and directing the resulting mixture through a first expansion nozzle means for adiabatic expansion cooling to generate said fine second particles of said ceramic, then mixing said fine second particles of said ceramic with vapor of said second metal at a point downstream of said first nozzle means, and then directing the resulting mixture through a second expansion nozzle means for adiabatic expansion cooling to condense said vapor of said second metal while incorporating said second particles therein thereby to generate said first particles.

4,594,102
RECOVERY OF COBALT AND NICKEL FROM SULPHIDIC MATERIAL

Donald R. Weir; Derek E. Kerfoot, both of Fort Saskatchewan, and Michael E. Chalkley, St. Albert, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Sep. 15, 1983, Ser. No. 532,331
Claims priority, application Canada, Mar. 29, 1983, 424733
Int. Cl.[4] C22B *23/00*
U.S. Cl. 75—119 **6 Claims**



1. A process for recovering cobalt and nickel values from cobalt and nickel containing sulphidic material also containing iron and zinc comprising roasting the sulphidic material to produce a calcine containing water-soluble cobalt and nickel sulphate, leaching the calcine in aqueous sulphate solution under oxidizing conditions at an oxygen overpressure in the range of from about 50 kPa to about 1500 kPa and at a temperature in the range of from about 100° to about 180° C. to produce an iron-containing residue and a cobalt, nickel and zinc containing solution, separating the residue from the solution, removing zinc from the solution in a two-stage zinc removal step including adding a sulphidizing agent to the solution in a first stage at a pH of from about 3 to about 5 to precipitate about 50 to 70% of zinc values as zinc sulphide, separating the precipitated zinc sulphide from the solution, adjusting the pH of the solution in a second stage to a value of from about 6 to about 7 to precipitate substantially all the remaining zinc as a low grade hydroxide with consequent precipitation of nickel and cobalt values, separating the low grade hydroxide and precipitated nickel and cobalt values from the solution, recycling the low grade hydroxide and precipitated nickel and cobalt values to a prior step in the process to recover said precipitated nickel and cobalt values, and recovering cobalt and nickel values from the remaining solution.

4,594,103
POWDERED NICKEL-CHROMIUM BASED MATERIAL FOR THERMAL SPRAYING

Wolfgang Simm, Ecublens, and Hans-Theo Steine, Chavannes, both of Switzerland, assignors to Castolin S.A., Saint-Sulpice, Switzerland

PCT No. PCT/CH84/00101, § 371 Date Feb. 21, 1985, § 102(e) Date Feb. 21, 1985, PCT Pub. No. WO85/00127, PCT Pub. Date Jan. 17, 1985
PCT Filed Jun. 20, 1984, Ser. No. 713,402
Claims priority, application Switzerland, Jun. 28, 1983, 3532/83
Int. Cl.[4] C22C *38/40*
U.S. Cl. 75—128 C **11 Claims**

1. A powdered spraying material for producing, by thermal spraying and fusing, protective coatings resistant to erosion, corrosion and oxidation, said material comprising a self-fluxing nickel-chromium-based alloy, characterized in that the alloy has the following composition, in percent by weight:

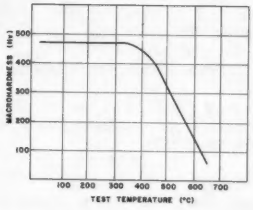
C	0.01–2.0	
Fe	0.1–25.0	except the range of 1.5–6
B	0.5–4.5	
Si	0.6–5.5	
Cr	18.0–35.0	
Ni	remainder,	

the boron content being equal to 75 percent of the respective silicon content, with a maximum deviation of ±10 percent.

4,594,104
CONSOLIDATED ARTICLES PRODUCED FROM HEAT TREATED AMORPHOUS BULK PARTS

Derek Reybould, Denville, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 26, 1985, Ser. No. 727,940
Int. Cl.[4] C22C *29/00*
U.S. Cl. 75—243 **26 Claims**



1. A method for producing a consolidated metal article, comprising the steps of:

(a) selecting a rapidly solidified alloy, which is at least 50% glassy;

(b) forming said alloy into a plurality of alloy bodies;

(c) compacting said alloy bodies at a pressing temperature of not more than about 0.6 Ts (solidus temperature measured in °C.) and at a pressure sufficient to bond said alloy bodies together into a glassy metal compact having at least about 90% T.D.; and

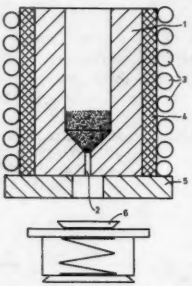
(d) heat treating said compacted alloy bodies at a heat treatment temperature ranging from about 0.55–0.85 Ts for a time period sufficient to provide a crystalline alloy consolidated article.

4,594,105

CASTING POWDER FOR THE CONTINUOUS CASTING OF STEEL AND A PROCESS FOR THE CONTINUOUS CASTING OF STEEL

Robert Grimm, Bergheim, and Bernd Sowade, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 693,621
Int. Cl.[4] C22B *21/00*
U.S. Cl. 75—257 6 Claims



1. In a casting powder useful in continuous casting of steel, consisting essentially of an inorganic oxidic material which is meltable at the casting temperature and a carbonaceous material,

the improvement which comprises said carbonaceous material being active carbon having a specific surface area, according to BET, of from 800 to 1200 square meters per gram.

4,594,106

SPRAYING MATERIALS CONTAINING CERAMIC NEEDLE FIBER AND COMPOSITE MATERIALS SPRAY-COATED WITH SUCH SPRAYING MATERIALS

Minoru Tanaka, Kobe; Kazuhisa Niwano, Miki; Tetsunori Minato, Ako, and Yastami Oka, Okayama, all of Japan, assignors to Tateho Kagaku Kogyo Kabushiki Kaisha, Kariya, Japan

Filed Feb. 21, 1984, Ser. No. 582,174
Claims priority, application Japan, Feb. 22, 1983, 58-028236; Feb. 22, 1983, 58-028237
Int. Cl.[4] C09D *5/10*
U.S. Cl. 106—1.12 9 Claims

1. In a granulated flame spraying composition having particle size with a average diameter in the range 10 micrometers through 500 micrometers comprising the mixture of a binder and a powdery material component selected from the group consisting of powdered metals, heat resistant ceramics, cermets, and resins;

the improvement comprising 1 to 50 parts by weight per 100 parts by weight of said powdery material of a ceramic needle fiber component selected from the group consisting of silicon carbide whisker crystals, silicon nitride whisker crystals and mixtures thereof of silicon carbide whisker crystals said silicon nitride whisker crystals;

wherein said powdery material component and said ceramic needle fiber component are granulated, whereby particles of said flame spraying composition have an average diameter in the range 10 micrometers through 500 micrometers.

4,594,107

DECORATIVE BURNISH GOLD COMPOSITION

Wolfgang Wild, and Günter Landgraf, both of Hanau, Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 556,846, Dec. 1, 1983, abandoned. This application May 10, 1985, Ser. No. 733,399
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245392
Int. Cl.[4] B06D *3/02*
U.S. Cl. 106—1.13 8 Claims

1. In a lead-free decorative burnish gold composition for the decoration of glass, comprising gold powder, a sparingly soluble gold compound or mixtures thereof and a flux; the improvement comprising, as the flux; a mixture of rhodium sulforesinate, bismuth resinate, zirconium resinate and a vanadium compound selected from the group consisting of vanadium resinates, vanadium alcoholates, vanadium pentoxide or mixtures thereof, wherein the vanadium content is 0.5–2 weight percent, calculated as vanadium pentoxide and the zirconium content is 0.3–0.6 weight percent calculated as zirconium dioxide with respect to the gold content, the flux having a metal content of 0.1–0.4 percent by weight of the composition.

4,594,108

HIGHLY PSEUDOPLASTIC POLYMER SOLUTIONS

George K. Greminger, Jr., and Mary K. Dehnke, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 533,186, Sep. 19, 1983, abandoned. This application Dec. 14, 1984, Ser. No. 682,566
Int. Cl.[4] C08L *1/08, 1/26*
U.S. Cl. 106—170 10 Claims

1. An aqueous suspension comprising a continuous aqueous phase containing suspended particles of water-insoluble material; wherein the suspension contains a thickener comprising (a) a water-soluble organic synthetic or modified natural polymer which has a viscosity of at least 5,000 centipoises measured as a 2 weight percent aqueous solution and (b) a water-insoluble, water-dispersible and water-swellable organic synthetic or modified natural polymer which is compatible with said water-soluble polymer, said water-insoluble polymer being present in an amount sufficient to increase the pseudoplastic behavior of an aqueous medium containing said composition relative to the pseudoplastic behavior of an aqueous medium containing the water-soluble polymer or said water-insoluble polymer alone.

4,594,109

AQUEOUS COMPOSITION FOR THE PROTECTION OF PAINT SURFACES

Nobuaki Kawabata, Yokohama, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,345
Claims priority, application Japan, Aug. 25, 1984, 59-177196
Int. Cl.[4] C08J *3/02*
U.S. Cl. 106—271 25 Claims

1. An aqueous composition for the protection of paint surfaces which comprises, as essential components emulsified and dispersed in water, the following components [A], [B] and [C]:

[A]a solid emulsion component composed of the following sub-components (a)–(c):

(a) 100 parts by weight of an oxygen-containing wax having an oxygen content of not less than 3.0% by weight and a melting point of 50° to 85° C.,

(b) 0.1–60 parts by weight of a polybutene having a number-average molecular weight of 300–3,000, and

(c) 10–200 parts by weight of a silicone oil having a viscosity of 50–5,000 cst. at 25° C.;

[B]a powdery emulsion component composed of the following sub-components (d)–(e):

(d) 0.2–20.0 times by weight the solid emulsion component [A]of substantially white-colored fine powder of an inor-

ganic material having a silicon content of not less than 23% by weight, and

(e) 0.2–30.0 times by weight the solid emulsion component [A]of white-colored fine powder of an inorganic or organic material substantially free of silicon; and

[C]less than 0.2 times by weight the solid emulsion component [A]of an emulsifier component.

4,594,110

PROCESS FOR PREPARING LACTOSE PRODUCTS

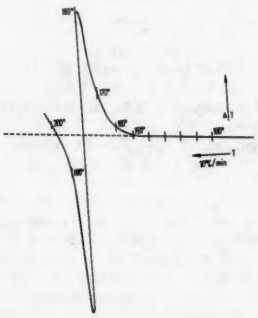
Klaas D. Kussendrager, Veghel, and Anton C. Andreae, Staphorst, both of Netherlands, assignors to DMA-Campina B.V., Netherlands

Filed Apr. 5, 1984, Ser. No. 597,177

Claims priority, application Netherlands, Apr. 7, 1983, 8301220

Int. Cl.⁴ C13K *5/00*

U.S. Cl. 127—31 **7 Claims**



1. A process for preparing stable anhydrous lactose products comprising the compound crystal form of the alpha form and the beta form of lactose, characterized by heating an unstable anhydrous lactose product, at atmospheric or sub-atmospheric pressure, at low water vapour pressure, and while avoiding overheating, to a temperature in the range of from 100° C. to 220° C., keeping the product at said temperature until crystallization of the compound crystal form of the alpha form and the beta form of lactose occurs.

4,594,111

LIQUID PHASE CLEANER-SOLVENT

Edmund C. Coonan, 3029 Holme Ave., Philadelphia, Pa. 19136

Filed Oct. 4, 1984, Ser. No. 657,604

Int. Cl.⁴ C23G *1/02*; B08B *7/00*; C11D *1/18, 1/38*

U.S. Cl. 134—3 **15 Claims**

1. An liquid aqueous cleaner-solvent consisting essentially of from about 50% to about 90% by weight of water, less than about 10% by weight of sodium chloride, from about ½ of 1% to about 10% by weight of coconut amide, from about ½ of 1% to about 8% by weight of a tall oil fatty acid, from about 1% to about 15% by weight of isopropyl alcohol and from about 5% to about 40% by weight of propylene carbonate said components constituting essentially 100 weight percent of the cleaner-solvent.

4,594,112

METHOD FOR PREVENTING FILIFORM CORROSION ON METAL SURFACES

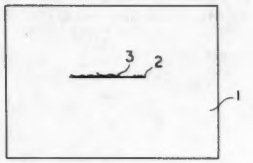
Shoichi Suzuki; Moriji Kurobe, both of Nagoya; Toshima Araga, Toyota, and Osamu Hiruta, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyota Chou Kenkyusho, Aichi, Japan

Continuation of Ser. No. 557,505, Dec. 2, 1983, abandoned. This application Aug. 6, 1985, Ser. No. 763,098

Claims priority, application Japan, Jun. 30, 1981, 56-102954

Int. Cl.⁴ C23C *22/00*; B05D *3/02*

U.S. Cl. 148—6.14 R **13 Claims**



1. A method for preventing filiform corrosion on a surface of a substrate under relative humidity of about 60 to 95% consisting of preparing a coating composition including a film forming component including resin selected from the group consisting of aminoalkyd resin, baking acrylic resin, cold curing acrylic resin, vinyl chloride resin, boiled oil, phenolic resin and oil-modified butadiene resin and 0.05 to 20% by weight, based on 100% by weight of said film forming component of a filiform corrosion preventing material of at least one hydroxide selected from the group consisting of calcium hydroxide, aluminum hydroxide, magnesium hydroxide and zinc hydroxide, applying said coating composition directly to said metal surface and baking or cold curing the coated substrate to form a cured coating so that said hydroxide is available to react with an acid formed by filiform corrosion on said metal surface under high humidity conditions, whereby the hydroxide is available to neutralize the acid at the surface to impede the progress of the filiform corrosion.

4,594,113

PROCESS FOR PRODUCING REINFORCING STEEL IN THE FORM OF RODS OR ROD WIRE

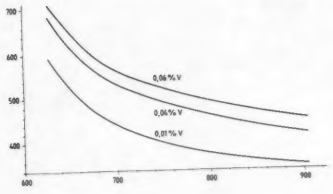
Emil Elsner, and Horst Brehmer, both of Gerlafingen, Switzerland, assignors to Von Roll AG., Gerlafingen, Switzerland

Filed May 28, 1985, Ser. No. 738,598

Claims priority, application Switzerland, May 30, 1984, 2675/84

Int. Cl.⁴ C21D *9/52*

U.S. Cl. 148—12 B **15 Claims**



1. A process for producing reinforcing steel characterized by a yield point of at least 450 N/mm^2 in combination with good weldability and toughness, which comprises:

(a) providing a steel alloy comprising nitriding elements and nitrogen;

(b) rolling said steel alloy; and

(c) cooling said steel alloy at an average compensating temper-

ature of greater than 700° C. such that there is a preferred nitride deposition below the gamma-alpha conversion range.

4,594,114

PROCESS FOR PRODUCING STRIP OF CORROSION RESISTANT ALLOY STEEL

Shigeaki Maruhashi; Kazuo Hoshino; Yoshihiro Uematsu; Katsuhisa Miyakusu, and Takehiko Fujimura, all of Yamaguchi, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

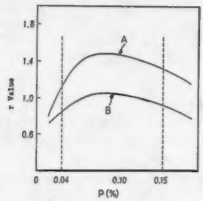
PCT No. PCT/JP83/00462, § 371 Date Jul. 24, 1984, § 102(e) Date Jul. 24, 1984, PCT Pub. No. WO84/02535, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 28, 1983, Ser. No. 634,020

Claims priority, application Japan, Dec. 29, 1982, 57-230833

Int. Cl.⁴ C21D *00/08*

U.S. Cl. 148—12 EA **15 Claims**



1. A process for the production of a strip of a corrosion resistant alloy steel having excellent workability, which process comprises subjecting a cold rolled strip of a steel containing in % by weight as essential components up to 0.05% of C, 10.00 to 18.00% of Cr, 0.005 to 0.50% of sol. Al and more than 0.40% but not more than 0.150% of P to a final annealing, said final annealing being carried out by heating the cold rolled strip in a box annealing furnace to an annealing temperature within the range between 650° C. and 900° C., and maintaining the strip in the furnace at the annealing temperature, the rate of heating at which the strip is heated from 300° C. to the annealing temperature being not faster than 300° C./hr.

4,594,115

PROCESS FOR THE MANUFACTURE OF RODS OR MACHINE WIRE OF MARTENSITIC STAINLESS STEEL AND THE PRODUCTS WHICH ARE PRODUCED

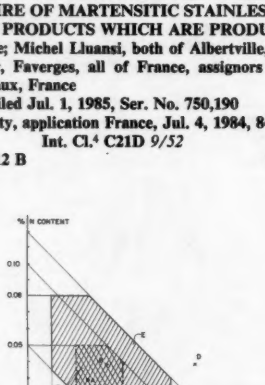
Michel Lacoude; Michel Lluansi, both of Albertville, and Philippe Munier, Faverges, all of France, assignors to Ugine Aciers, Puteaux, France

Filed Jul. 1, 1985, Ser. No. 750,190

Claims priority, application France, Jul. 4, 1984, 84 11050

Int. Cl.⁴ C21D *9/52*

U.S. Cl. 148—12 B **10 Claims**



1. In a process for the manufacture of martensitic stainless steel rods or machine wire, wherein a steel is provided and is cast in the form of intermediate products, and the cast intermediate products are transformed by hot rolling, comprising an optional rough preliminary processing, an optional preheating and a final hot rolling to produce a final product, the improvement comprising steel of the following composition, % by weight:

C=0.015 to 0.090
N=0.015 to 0.080 with C+N=0.05 to 0.120
Cr=9.0 to 14.0
Nb=≦0.1
V=≦0.1
S=≦0.35
Si=≦1.0
Mn=≦1.0
Ni=≦2.0
Mo=≦1.0
P=≦0.040
Cu=≦1.0
Fe and impurities=balance

and wherein the preheating or the end of the hot rough preliminary processing preceding the final hot rolling brings the products to a temperature betwen 1000° C. and 1160°, and wherein the final hot rolling which is effected at a temperature below or equal to 1150° C. produces a section reduction "S/s" which is at least equal to 3, and which reduction is followed by homogenous cooling.

4,594,116

METHOD FOR MANUFACTURING HIGH STRENGTH COPPER ALLOY WIRE

Tom Inagaki, LaGrangeville, N.Y., assignor to Hudson Wire Company, Ossining, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,890

Int. Cl.⁴ C22F *1/08*

U.S. Cl. 148—12.7 C **5 Claims**

1. A method for manufacturing a wire from a copper precipitation hardenable alloy wherein the alloy consisting essentially of about 0.38% beryllium, 1.66% nickel and the remainder copper, said method comprising one or more processing steps and characterized in that said steps conclude with cold working the alloy to a wire and to an area reduction of at least 99% followed by precipitation heat treatment at a temperature of 750°–950° F. for a period of 1–4 hours and wherein the resulting wire has a tensile strength of at least 95,000 psi and an electric conductivity of at least 60% IACS.

4,594,117

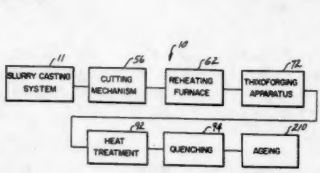
COPPER BASE ALLOY FOR FORGING FROM A SEMI-SOLID SLURRY CONDITION

Michael J. Pryor, Woodbridge; Joseph Winter, New Haven, and Jonathan A. Dantzig, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 337,560, Jan. 6, 1982, Pat. No. 4,494,461. This application May 31, 1984, Ser. No. 616,081

Int. Cl.⁴ C22C *9/06, 9/01;* C22F *1/08, 3/00*

U.S. Cl. 148—414 **9 Claims**



1. A copper base alloy having a structure comprising a plurality of discrete particles in a surrounding metal matrix, said particles and said matrix being comprised such that when said alloy is heated to a desired temperature said alloy forms a semi-solid slurry wherein said matrix is in a molten condition comprising from about 5 to about 40% liquid and said particles are within said liquid matrix, said alloy consisting essentially of

about 3% to about 20% nickel, about 5% to about 10% aluminum, and the balance essentially copper.

4,594,118

EXPLOSIVE COMPOSITION WITH BUBBLE ENHANCER

David J. Curtin, Ashburton, and David E. Yates, East Brunswick, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Apr. 15, 1985, Ser. No. 723,568
Claims priority, application Australia, Apr. 19, 1984, PG4650
Int. Cl.[4] C06B *45/00*
U.S. Cl. 149—2 **19 Claims**

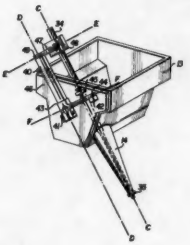
1. A gas bubble sensitized water-in-oil emulsion explosive composition comprising a discontinuous aqueous phase comprising at least one oxygen-releasing salt, a continuous water-immiscible organic phase, a discontinuous gaseous phase, a water-in-oil emulsifying agent and at least one agent capable of facilitating the production of gas bubbles in the presence of said water-immiscible organic phase.

4,594,119

AUTOMATIC CENTERING OF MOLTEN METAL POUR SPOUT METERING PIN

Giuseppe Baldassari, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 231,985, Dec. 8, 1980, abandoned. This application Jul. 27, 1984, Ser. No. 635,317
Int. Cl.[4] B32B *35/00*; B22D *11/06*
U.S. Cl. 156—94 **8 Claims**



1. A method for aligning a pour spout with a molten metal pour pot, comprising the steps of:

predetermining a longitudinal axis of the proper molten metal path exiting through the pour spout;

arranging the pour spout on an alignment rod;

securing the alignment rod to an alignment jig;

adjusting the alignment jig to align the longitudinal axis of the pour spout with the predetermined longitudinal axis;

fixing the pour spout to the pour pot in its aligned position;

removing the alignment rod from the pour spout; and

then replacing the alignment rod with a metering pin positioned along the predetermined longitudinal axis.

4,594,120

METHOD FOR INSTALLING A SEPTUM IN HONEYCOMB CORE

Gordon Bourland, Jr., Arlington, and Howard M. Price, Burleson, both of Tex., assignors to LTV Aerospace and Defense Company, Dallas, Tex.

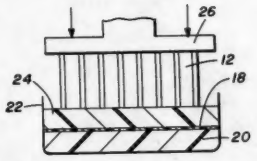
Filed Jul. 27, 1981, Ser. No. 286,730
Int. Cl.[4] B32B *31/26*
U.S. Cl. 156—155 **18 Claims**

1. A method for installing a transverse septum into a honeycomb core comprising the steps of:

sandwiching the septum in a support material having a melting temperature above the fusing temperature of the septum;

pressing the honeycomb core into the support material and through the septum to segment said septum in segments and position the septum at a predetermined depth within the cells of said honeycomb core;

heating the honeycomb core, segmented septum and support material sufficiently to fuse and adhere the septum to the honeycomb core;



subsequently heating the honeycomb core, segmented septum and supporting material sufficiently to melt the supporting material;

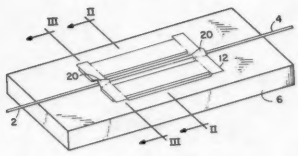
draining the molten support material away from the honeycomb core and segmented septum in place therein and heating the honeycomb core and segmented septum to a temperature above the melting point of the support material which also has a melting temperature that is less than the temperature for curing the system for a sufficient period of time to cure the septum in place.

4,594,121

METHOD OF SPLICING ELONGATE MEMBERS OF GENERALLY CYLINDRICAL FORM IN A PREDETERMINED POSITION

John H. Mitch, Troutdale, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 7, 1985, Ser. No. 709,478
Int. Cl.[4] B65H *69/02*; G02B *6/38*
U.S. Cl. 156—158 **10 Claims**

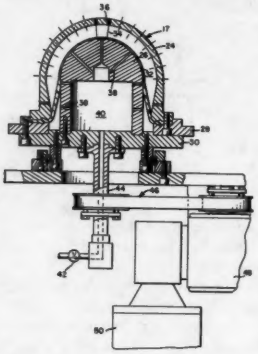


1. A method of placing an end portion of an elongate member of generally cylindrical form in a predetermined position utilizing a substrate having a surface that is defined by a generatrix that is a straight line, said method comprising securing to said surface a foil of flexible material that defines with the substrate a generally straight, elongate passageway that is parallel to the generatrix of said surface and has a first portion of substantially uniform cross-section adapted to receive an end of the elongate member in closely fitting relationship and also has a second portion that tapers towards said first portion, and inserting said end portion of the elongate member into the first portion of the passageway by way of said second portion thereof.

4,594,122
APPARATUS FOR PREPARING A CONTOURED PREFORM

Ronald F. McConnell, West Chester, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Feb. 26, 1985, Ser. No. 705,912
Int. Cl.[4] B32B *5/02*
U.S. Cl. 156—433 9 Claims

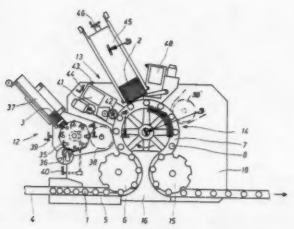


1. Apparatus for forming a reinforced composite structure comprising a hollow form having a contoured surface provided with multiple apertures, an inflatable elastic diaphragm within said form and multiple pins projecting from the diaphragm into said apertures, said pins projecting from the form when the diaphragm is inflated and presenting a densely packed bed into which a strand can be deposited according to a desired pattern, said apertures being larger than the pins, said pins thereby being deflectible, means for inflating said diaphragm, and means for laying strand between said pins.

4,594,123
LABELING MACHINE FOR CONTAINERS

Erich Eder, Donaustauf, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Dec. 24, 1984, Ser. No. 685,305
Int. Cl.[4] B65C *9/04, 9/10*
U.S. Cl. 156—456 7 Claims



1. A machine for applying to containers such as bottles a selected one of normal length labels that do not encircle the containers (non-encircling labels) or extra-length labels that encircle the containers (encircling labels), said machine comprising:

a rotary table driven rotationally for transporting containers in a circular path,

a plurality of rotary plate means for supporting transported containers and arranged in circumferentially spaced apart relationship on said table in said circular path and means supporting said plate means, respectively, on said table for rotating about axes parallel to the rotational axis of said table,

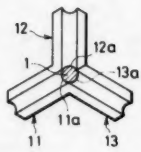
one station including means arrangeable adjacent said path selectively operable to apply non-encircling labels to said containers and another station including means arrangeable adjacent said path selectively operable to apply encircling labels, said one station including a first holder for non-encircling labels, means for picking up a label from said first holder and means for depositing a glue coated label on a passing container, said other station including a second holder for encircling labels, means for applying glue to said containers for a passing container to pick up a label from said second holder,

first and second drive means connectible alternately to said rotary plate means, said first drive means being operative to rotate said plate means and containers thereon through suitable angles of rotation for securing said non-encircling labels on the containers and said second drive means being operative to rotate said plate and containers thereon through suitable angles of rotation for securing said encircling labels on said containers.

4,594,124
APPARATUS FOR THE PRODUCTION OF LAMINATED SHEATH CABLES

Fumio Harano; Shigeyoshi Kaneta; Kunihiro Nakagaki, and Satoshi Nishiyama, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 14, 1985, Ser. No. 691,041
Claims priority, application Japan, Jan. 26, 1984, 59-13025
Int. Cl.[4] H01B *13/26*
U.S. Cl. 156—468 5 Claims



1. An apparatus for the production of a laminated sheath cable, comprising, in order: a forming unit where a cable core is longitudinally wrapped with a laminating tape in such a manner that the laminating tape is overlapping along the cable core; an overlapping jig for preventing the overlapping portions of said laminating tape from bunching; a squeezing die for squeezing said cable core with said laminating tape provided thereon; a heating unit for rendering molten at least said overlapping portions of said laminating tape; and pressing means for pressing together the heated overlapping portions, wherein the improvement comprises: said pressing means comprises n rollers, each having a pressing portion having an arc length determined by dividing an outer circumference of said cable core by n, where n is an integer of 3 or more, disposed so as to press said laminating tape toward said cable core at a single position in the lengthwise direction of said cable core.

4,594,125
APPARATUS FOR MAKING LAMINATED LABELS

Douglas M. Watson, 3684 Forrest Park Blvd., St. Louis, Mo. 63108

Filed Mar. 12, 1984, Ser. No. 588,391
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—516 8 Claims

1. Apparatus for making labels of the type comprising a central substrate layer disposed between first and second cover layers, and a backing layer, said apparatus comprising:

means for holding a stack of sheets of substrate material;

means for feeding individual sheets from said stack one after another at a substantially uniform rate in a forward direction for travel along a path through said apparatus with the leading end of one sheet closely adjacent the trailing end of the sheet in front of it;

means for rotatably mounting a first supply roll of web material corresponding to said first cover layer;

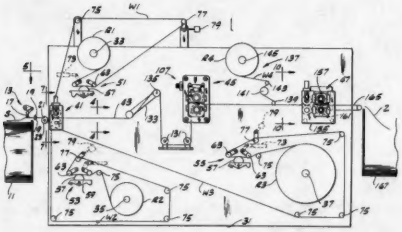
means for rotatably mounting a second supply roll of web material corresponding to said second cover layer;

means for rotatably mounting a third supply roll of web material corresponding to said backing layer;

said web material being adapted to be pulled from said first, second and third supply rolls;

first glue-applicator means for applying glue to one face, constituting the inside face, of web material pulled from the first supply roll;

second glue-applicator means for applying glue to one face, constituting the inside face, of web material pulled from the second supply roll;



third glue applicator means for applying glue to one face, constituting the inside face, of web material pulled from the third supply roll;

means downstream from said first, second and third glue-applicator means for combining said sheets and web materials as the sheets are fed forwardly and as the web materials are pulled from respective first, second and third supply rolls to form a laminated strip of label material, said combining means being adapted to bring the inside glue-bearing faces, of web material pulled from said first and said second supply rolls into face-to-face contact with opposite faces of each sheet of substrate material to form said cover layers, and to bring the inside glue-bearing face of web material pulled from said third supply roll into face-to-face contact with the outside face of one of the cover layers to form said backing layer; and

die cutting means downstream from said combining means for cutting through said cover layers of said laminated strip thereby to form individual labels on the backing layer.

4,594,126

GROWTH OF THIN EPITAXIAL FILMS ON MOVING SUBSTRATES FROM FLOWING SOLUTIONS

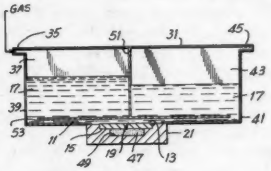
Melvin S. Cook, P.O. Box 38, Saddle River, N.J. 07458

Continuation-in-part of Ser. No. 531,230, Sep. 12, 1983. This application Jul. 12, 1984, Ser. No. 630,211

Int. Cl.[4] C30B *19/06*

U.S. Cl. 156—608 **2 Claims**

1. A method of growing an epitaxial layer of a material on a surface of a substrate from a solution, comprising the steps of moving said surface of said substrate across the width of a first side of a first channel having a length substantially greater than its width, said first channel having an inlet communicating with a reservoir of solution and an outlet communicating with a receiver of solution, forcing at least a part of the solution from the reservoir to enter the first channel via said inlet so as to flow through the first channel and to leave the first channel via said outlet and to enter the receiver, the substrate having a dimension in the direction of movement thereof which is substantially greater than the width of said first side of said first channel so as to expose at any given time only a portion of said surface to contact with said at least part of said solution in said first channel such that different portions of the substrate are successively brought into contact and removed from contact with said at least part of said solution flowing in said first channel, said first channel being configured such that streamline flow of said at least part of said solution takes place in the region of any portion of said surface of the substrate in contact with the flowing solution, causing a coolant fluid to flow in a



second channel while in heat exchange relationship with the substrate to lower the temperature of the substrate relative to the saturation temperature of said at least part of said solution entering said first channel, thereby to induce the growth of an epitaxial layer of material on each portion of said surface which is exposed to the flow of said at least part of said solution, said growth of said epitaxial layer of said material on each portion of said surface of the substrate taking place during said flow of said at least part of said solution through said first channel.

4,594,127

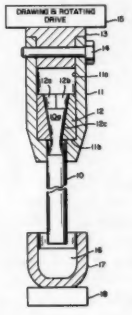
METHOD AND APPARATUS FOR GROWING CRYSTALS

Richard L. Lane, Penfield, and Donald J. Fanale, Rochester, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Sep. 17, 1984, Ser. No. 650,949

Int. Cl.[4] C30B *15/32*

U.S. Cl. 156—617 R **9 Claims**



1. The method of detachably suspending a seed crystal, over a crucible containing a melt, from a rotary and axially operable vertically disposed adapter comprising the steps of;

(a) forming a tubular receptacle having upper and lower ends, said tubular receptacle being detachably securable at its upper end, in a coaxial manner to an adapter and having an internal bore formed therein with an internally stepped bore portion defining an opening near the lower end for supporting a seed crystal.

(b) forming the seed crystal integrally in the shape of a cylindrical rod having a diameter of sufficient size to pass

through the stepped opening of the tubular receptacle in either axial direction and having an upper end conically tapered downwardly and inwardly for a limited distance from the upper end thereof,

(c) forming a split sleeve of sufficient size to be downwardly receivable within the internal bore of the tubular receptacle and limited in a downward movement by the internal stepped opening of the tubular receptacle.

(d) the split sleeve having an internal conically tapered bore complimentary shaped to the taper of the upper end of the seed crystal,

(e) suspending the seed crystal from the adapter by hand, without the use of force, comprising the steps of,

(1) firstly, placing the split sleeve around the tapered upper end of the seed crystal,

(2) secondly, inserting the seed crystal and split sleeve downwardly in the bore of the tubular receptacle until the split sleeve rests at the internal stepped opening of the tubular receptacle, and,

(3) thirdly, detachably securing the upper end of the tubular receptacle coaxially to the adapter,

(f) whereby the seed crystal is operably secured coaxially within the tubular receptacle to be rotated and axially movable by the adapter solely because of frictional connecting forces between the seed crystal and the split sleeve and between the split sleeve and the internal bore of the tubular receptacle as governed by the weight of the seed crystal and the weight of a crystal as it is grown.

4,594,128

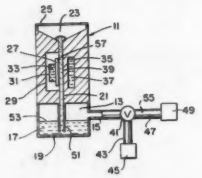
LIQUID PHASE EPITAXY

Melvin S. Cook, P.O. Box 38, Saddle River, N.J. 07458

Filed Mar. 16, 1984, Ser. No. 590,469

Int. Cl.[4] C30B *19/02*

U.S. Cl. 156—622 **6 Claims**



1. A method of growing an epitaxial layer of a material on a surface of a substrate from a solution, comprising the steps of positioning said substrate at a first side of a first channel having an inlet communicating with a solution reservoir, forcing at least part of said solution from said solution reservoir to flow into said first channel via said inlet only until said first channel is substantially filled with said at least part of said solution in the vicinity of said substrate where epitaxial growth of material on said surface is desired, and maintaining the temperature of said substrate at a value below the saturation temperature of said at least part of said solution by passing a cooling fluid through a second channel in heat exchange relationship with said substrate, thereby causing material to deposit onto said surface of said substrate from said at least part of said solution while the latter is stationary in said first channel and said epitaxial layer to grow on said surface, said first channel at said surface of said substrate having a breadth which in magnitude is at least ten times the magnitude of the depth of said first channel.

4,594,129

INSTALLATION FOR FLOATING TRANSPORT AND PROCESSING OF SUBSTRATES

Edward Bok, Burg. Amersfoordtlaan, 1171 DR Badheovedorp, Netherlands

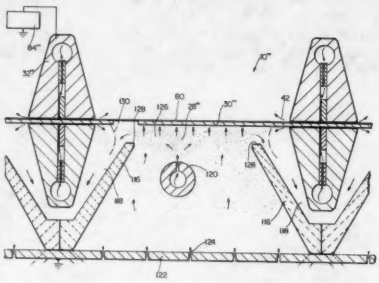
PCT No. PCT/NL84/00018, § 371 Date Dec. 20, 1984, § 102(e) Date Dec. 20, 1984, PCT Pub. No. WO85/00086, PCT Pub. Date Jan. 3, 1985

PCT Filed Jun. 15, 1984, Ser. No. 700,581

Claims priority, application Netherlands, Jun. 16, 1983, 8302163

Int. Cl.[4] B44C *1/22;* **C03C** *15/00;* **B32B** *31/00*

U.S. Cl. 156—630 **18 Claims**



1. Method of tensioning during processing of substrates and tape combrising:

a. advancing said substrates and tape through a longitudinal passage defined by an elongated housing having side and end walls and supporting pairs of transporter sections positioned above and below and extending laterally across said longitudinal passage;

b. introducing a pressurized gaseous transport medium through said transporter sections and into said longitudinal passage;

c. injecting a pressurized processing medium into a processing chamber, defined beneath said substrates and tape intermediate pairs of said transporters, while continuously removing gaseous transport medium and pressurized processing medium; and

d. tensioning said tape accordingly as the heat of processing affects said tape.

4,594,130

PULPING OF LIGNOCELLULOSE WITH AQUEOUS ALCOHOL AND ALKALINE EARTH METAL SALT CATALYST

Pei-Ching Chang, 7211 Frances St., Burnaby, B.C., and Laszlo Paszner, 3906 W. 33rd Ave., Vancouver, B.C., both of Canada

Continuation of Ser. No. 284,632, Jul. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 126,441, Mar. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 94,721, Nov. 27, 1979, abandoned. This application Jul. 7, 1983, Ser. No. 511,717

Claims priority, application Canada, Nov. 27, 1978, 316951; Fed. Rep. of Germany, May 22, 1979, 2920731; Canada, Jul. 25, 1980, 359443

Int. Cl.[4] D21C *3/20, 11/00*

U.S. Cl. 162—16 **29 Claims**

1. In a process for converting lignocellulosic plant material to the form of separated fibers in which the plant material is cooked in a confined chamber at elevated pressure in the absence of added oxygen with an initially neutral or acidic aqueous mixture of a lower aliphatic alcohol having one to three carbon atoms at elevated temperature, the improvement which consists essentially of the steps of:

(a) cooking fragmented lignocellulosic material with an

aqueous solvent mixture containing a major volume proportion of the alcohol and containing a catalytic amount of a magnesium, calcium or barium salt of a strong inorganic acid or mixtures thereof which promotes separation of the fibers in the lignocellulosic material in the solvent mixture at elevated temperatures as a primary catalyst which is soluble in at least the catalytic amount in the mixture to form magnesium, barium and calcium ions dissolved therein at an elevated temperature between 145° C. and 240° C. and optionally a catalytic amount of an acidic compound as a secondary catalyst;

(b) maintaining the cooking temperature for at least 2 minutes and sufficient to effect at least partial depolymerization and dissolution of lignin and hemicellulose and other cell wall constituents encrusting the cellulose fibers and to render the fibers separable from each other to produce a pulp which has a 0.5 CuEn Tappi viscosity of 14 or above; and

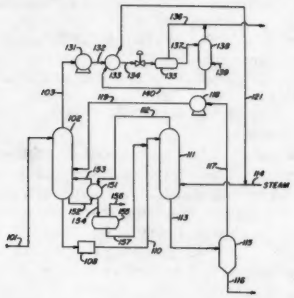
(c) recovering the separated fibers, lignin materials and sugars from liquor residue.

4,594,131

PROCESS FOR REMOVING AMMONIA AND ACID GASES FROM PROCESS STREAMS

Edward E. Maier, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 13, 1984, Ser. No. 640,063
Int. Cl.[4] B01D *3/38*
U.S. Cl. 203—26 **4 Claims**



1. A process for achieving substantially complete removal of acid gases and ammonia from a dilute aqueous solution thereof, said solution also containing free and fixed ammonia salts, said process comprising:

(a) subjecting said solution to a first countercurrent multi-stage continuous distillation, said distillation being conducted by heating said solution, at least in part by means of a stripping vapor, and by having a gradient of ammonia concentration decreasing towards the region of bottom liquid withdrawal which results in said bottom liquid having a pH of less than about 8.0,

(i) withdrawing from this first distillation an overhead vapor stream containing a major proportion of stripping vapor, substantially all of said acid gases from said solution, and substantially all of the ammonia from said free ammonia salts,

(ii) withdrawing from this distillation an aqueous bottom stream which contains substantially all of said fixed ammonia salts,

(b) adding alkali to said withdrawn bottom stream, said alkali being added in an amount sufficient to evolve ammonia contained in said fixed ammonia salts during subsequent distillation of said mixture,

(c) subjecting said withdrawn bottom stream to a second countercurrent multi-stage continuous distillation,

(i) withdrawing from said second distillation an overhead vapor stream said vapor steam containing a portion of the ammonia from said fixed ammonia salts,

(ii) withdrawing from said second distillation an aqueous bottom stream, the improvement comprising:

(d) compressing the overhead vapor stream being withdrawn from said first distillation,

(e) condensing the compressed overhead vapor stream from said first distillation,

(f) partially vaporizing a portion of the liquid stream produced by condensing said overhead vapor stream from said first distillation, to produce a vapor stream of ammonia and acid gases and a purified liquid stream having a reduced concentration of ammonia and acid gases, and

(g) further purifying said liquid stream produced in step (f) by stripping the liquid with steam to remove additional ammonia and acid gases, and

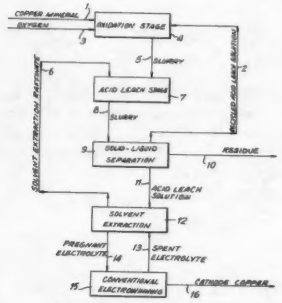
(h) vaporizing said purified liquid stream produced in step (g) to produce a vapor stream reduced in ammonia and acid gas content.

4,594,132

CHLORIDE HYDROMETALLURGICAL PROCESS FOR PRODUCTION OF COPPER

Donald P. Satchell, Jr., Princeton Junction, N.J., and John N. Gerlach, Morenci, Ariz., assignors to Phelps Dodge Corporation, New York, N.Y.

Filed Jun. 27, 1984, Ser. No. 625,139
Int. Cl.[4] C25C *1/00, 1/12*
U.S. Cl. 204—105 R **16 Claims**



1. A process for extracting metals from metal sulfides, comprising the stepp of:

(a) contacting a metal sulfide with a first solution which is an aqueous cupric chloride solution to leach the metal therefrom and to form a second solution containing said metal and cuprous chloride, while adding an oxidant to oxidize the cuprous chloride in said second solution, whereupon a metal hydroxide is precipitated in said second solution, the precipitation of said metal hydroxide resulting in the formation of hydrogen ions;

(b) adding an acid to said second solution, thereby dissolving the metal hydroxide precipitate with said acid, thus forming a third solution in contact with a remaining metal sulfide;

(c) separating the third solution from the remaining metal sulfide;

(d) recycling a portion of the separated third solution to step (a);

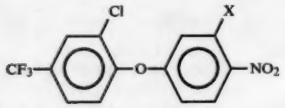
(e) extracting the metal remaining in the non-recycled portion of said separated third solution with an organic phase;

(f) recycling raffinate from step (e) to step (b) for use as the acid;

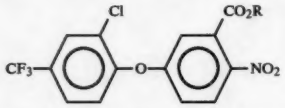
(g) stripping the metal from the organic phase with an aqueous stripping solution;
(h) electrowinning the metal from the aqueous stripping solution; and
(i) recycling spent electrolyte from step (h) for use as the aqueous stripping solution of step (g).

4,594,133
PROCESS FOR PREPARING 3'-HALODIPHENYLETHERS
Dennis R. Patterson, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.
Filed Sep. 16, 1985, Ser. No. 776,195
Int. Cl.[4] B01J 11/12
U.S. Cl. 204—158.1 8 Claims

1. A process for preparing a compound having the formula:



wherein X is bromo or iodo which comprises reacting a diphenylether having the formula:



where R is hydrogen or an alkali metal or alkaline earth metal salt thereof, with mercuric oxide and molecular bromine or iodine in a nonpolar solvent at about atmospheric pressure in a substantially inert atmosphere, in the presence of light at temperatures from about 65° C. to about 150° C.

4,594,134
METHOD FOR PREPARING A SPHERICAL CURED POLYMER OR A COMPOSITION THEREOF CONTAINING LINEAR ORGANOPOLYSILOXANE BLOCKS
Tsuneo Hanada, and Yoshitsugu Morita, both of Ichihara, Japan, assignors to Toray Silicone Company, Limited, Tokyo, Japan
Continuation-in-part of Ser. No. 538,796, Oct. 4, 1983, abandoned. This application Nov. 9, 1984, Ser. No. 670,369
Claims priority, application Japan, Oct. 12, 1982, 57-179390
Int. Cl.[4] C08F 2/46
U.S. Cl. 522—99 11 Claims

1. A method for preparing a spherical cured product having a diameter of 5 mm or less comprising curing, in an atomized state, a curable material selected from the group consisting of a curable polymer containing at least 10 weight percent of linear organopolysiloxane blocks having the structural formula

$$+R_2SiO+_n$$

wherein R's are the same or different and are monovalant hydrocarbon groups; and n is an integer of 5 or more; and a curable polymer composition, said composition including said curable Polymer.

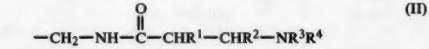
4,594,135
PROCESS AND APPARATUS FOR ELECTRICALLY DESORBING COMPONENTS SELECTIVELY SORBED ON GRANULES
Arthur L. Goldstein, Weston, Mass., assignor to Ionics Incorporated, Watertown, Mass.
Filed Feb. 20, 1985, Ser. No. 703,581
Int. Cl.[4] C07K 3/18
U.S. Cl. 204—180.1 18 Claims

3. A method for recovering biospecifically, sorbable components sorbed on a body of granules having biospecific sorbing properties for said components comprising:
(a) passing a direct electric current through said body of granules and an ion-permeable barrier juxtaposed with said body of granules in a direction substantially parallel to the smallest dimension of said barrier, thereby facilitating the desorption of at least one of said components having biospecific sorbing properties for said granules; and
(b) removing said desorbed components from contact with said granules.

4,594,136
CATHODIC ELECTROCOATING BINDERS
Eberhard Schupp, Schwetzingen; Werner Loch, Erpolzheim; Rolf Osterloh, Gruenstadt, and Klaas Ahlers, Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Division of Ser. No. 547,085, Oct. 31, 1983, Pat. No. 4,542,193. This application Jul. 17, 1985, Ser. No. 755,725
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311512
Int. Cl.[4] C25D 13/00
U.S. Cl. 204—181.7 4 Claims

1. A method of cathodic electrocoating of electrically conductive surfaces in which the electrically conductive surfaces to be coated are connected as the cathode and dipped into an aqueous cathodic electrocoating bath containing a binder, which bath has a solids content of from 5 to 30% by weight, a temperature of 15° to 40° C., and a pH of 4.0 to 8.5, the deposition being effected at a voltage of from 50 to 500 volt and hardening the deposited film at above 140° C.,
wherein the binder is water-dilutable on addition of acid, is suitable for preparing cathodic electrocoating compositions and comprises a mixture of
(A) from 60 to 95% by weight of a polyadduct which carries basic nitrogen groups and contains groupings of the formula (I) or (II) or (I) and (II)

(I)



(II)

where R^1 and R^2 are identical or different and each is hydrogen or methyl, and R^3 and R^4 are identical or different and each is alkyl of 1 to 9 carbon atoms or hydroxyalkyl of 2 to 10 carbon atoms, or R^3 and R^4 together are a 5- or 6-membered ring and
(B) from 5 to 40% by weight of a reaction product of a polyisocyanate and an olefinically unsaturated amine which carries a secondary amino group and a methacrylamide or methacrylate group.

4,594,137
STAINLESS STEEL OVERCOAT FOR SPUTTERED FILMS

F. Howard Gillery, Allison Park, and Russell C. Criss, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

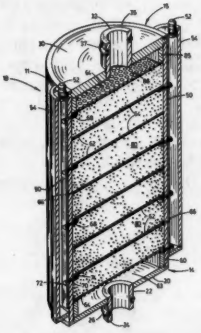
Filed Sep. 9, 1983, Ser. No. 530,570
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192 SP **14 Claims**

1. In a method for coating a substrate with an elemental metal film selected from the group consisting of silver, copper, gold, platinum and palladium by cathode sputtering, the improvement which comprises depositing over the elemental metal film a protective overcoat of a metal which forms a dense oxide surface which protects said elemental metal film from oxidation.

4,594,138
FLUID FILTER

Donald E. Thompson, P.O. Box 1036, Hughson, Calif. 95326

Filed May 17, 1984, Ser. No. 611,311
Int. Cl.[4] B01D *35/06*
U.S. Cl. 204—302 **7 Claims**



1. A filter for removing particles from fluids in a fluid system comprising:

a housing having an internal chamber and providing a first, inlet end portion and an opposite, outlet end portion remote therefrom, the inlet end portion being adapted for connection in fluid-flow relation to a portion of the fluid flow system for delivery of fluids from the fluid system into the internal chamber, and the outlet end portion being adapted for connection in fluid-flow relation to a portion of the fluid system for discharge of fluids from the internal chamber to the fluid system to define an axial path of fluid flow through the chamber from the inlet end portion to the outlet end portion;

a plurality of electrically-conductive electrode members spaced axially of each other within the internal chamber, each electrode member having a substantially flat body providing a multiplicity of bores of predetermined dimensions therethrough, the electrode members being disposed substantially transversely of the path of fluid flow, each electrode providing a peripheral edge portion thereabout and having a tab member extending from the peripheral edge portion;

a pair of elongated shield members mounted externally of the housing in spaced relation to each other;

a pair of elongated electrically-conductive buss bar members borne externally of the housing in spaced relation to each other, one buss bar member being connected in electrically-conductive relation to at least one electrode member and having a connector portion adapted to be connected in electrically-conductive relation to a predetermined first terminal of a source of electrical energy of selected electrical potential operative to impart an electrical charge to said at least one electrode member, and the other buss bar member being connected in electrically-conductive relation to the remaining electrode members not connected to the other buss bar member and having a connector portion adapted to be connected in electrically-conductive relation to a second terminal of a source of electrical energy of selected electrical potential operative to impart a substantially equal electrical charge opposite to that imparted to said at least one electrode member to each of the remaining electrode members, the buss bar members individually being borne intermediate the housing and a shield member, the connector portion of each buss bar member being disposed externally of the shield member and the housing;

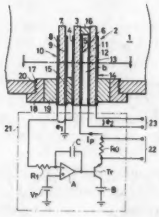
a plurality of electrically conductive pin members extending from the buss bar members each having an end portion internal of the housing and captured closely between the peripheral edge portion and the tab member of an electrode member in electrically conductive relation thereto, the pin members being connected on the electrode members to dispose alternate electrode members in parallel electrical relation; and

porous filter media disposed between adjacent electrode members, the filter media each having a multiplicity of passages therethrough for flow of fluids through the passages and capturing of particles therein.

4,594,139
AIR/FUEL RATIO DETECTOR

Yoshiaki Asayama, Hyogo; Tetsusyo Yamada, and Shintaro Hirate, both of Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and NGK Spark Plug Co., Ltd., both of, Japan

Filed Dec. 13, 1984, Ser. No. 681,335
Claims priority, application Japan, Dec. 15, 1983, 58-237620
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—410 **15 Claims**



1. An air/fuel ratio detector for monitoring the concentration of a particular gas in the exhaust gas from a combustion device, said detector comprising:

(a) first solid electrolyte sensing means for generating a first output signal indicating whether said concentration of said particular gas in said exhaust gas is above or below a predetermined value; and

(b) second solid electrolyte sensing means for generating a second output signal indicating at least one specific value of said concentration above or below said predetermined value, whereby an air/fuel ratio across a range surrounding said predetermined value may be detected, said second solid electrolyte sensing means comprising:

(i) a first solid electrolyte element with electrodes on both sides;

(ii) a second solid electrolyte element with electrodes on both sides, positioned on one side of said first element, with a first gap between said second element and said first element; and

(iii) means for producing electric current through said first element,

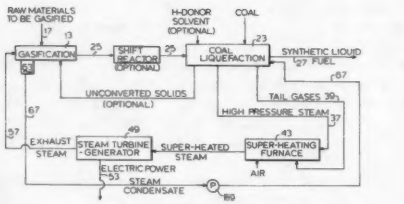
said first element changing the level of said concentration in said first gap in accordance with said current for creating a constant first electromotive force between the electrodes of said second element.

4,594,140

INTEGRATED COAL LIQUEFACTION, GASIFICATION AND ELECTRICITY PRODUCTION PROCESS

Shang-I Cheng, 17 Woodsend Dr., Matawan, N.J. 07747

Filed Apr. 4, 1984, Ser. No. 596,614
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—414 **6 Claims**



THE FLOWSHEET OF A GASIFICATION-COAL LIQUEFACTION GENERATION COMPLEX

1. A method for the physical and operational integration of a carbonaceous gasification plant, a gas fuel synthesis plant and a power generation station to economically produce synfuel and electric power comprising:

(a) producing synthesis gas comprising carbon monoxide and hydrogen from carbonaceous raw materials in a gasification unit under endothermic reaction conditions wherein the gasification unit utilizes exhaust steam from step (f) effective to provide at least a portion of the endothermic heat of reaction necessary for the reaction and wherein said gas from the gasification unit is passed to a coal liquefaction stage;

(b) liquefying and hydrogenating coal under exothermic reaction conditions with said synthesis gas from said gasification unit as a source of hydrogen thereby producing a synthetic hydrocarbonaceous fuel and tail gases;

(c) providing water to said liquefaction stage in an indirect heat exchange relationship to remove at least a portion of the exothermic heat of reaction from said coal liquefaction stage by generating high pressure steam from said water and passing said high pressure steam to a power generation unit;

(d) continuously purging the tail gases from said liquefaction stage, feeding said tail gases to said power generation unit and burning said tail gases with or without additional fuel sources to superheat said high pressure steam;

(e) passing said superheated steam to a turbine-generator means within said power generating unit to produce electricity and exhaust steam; and

(f) feeding at least a portion of said exhaust steam from said power generating unit to said gasification unit .

4,594,141

CONVERSION OF HIGH BOILING ORGANIC MATERIALS TO LOW BOILING MATERIALS

Stephen C. Paspek, Jr., North Royalton, and Curtis D. Coker, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 18, 1984, Ser. No. 682,926
Int. Cl.[4] C10G *11/00, 11/08*
U.S. Cl. 208—390 **32 Claims**

1. A process for the conversion of high boiling organic materials to lower boiling materials comprising contacting said high boiling organic materials at a temperature of at least about 300° C. and at a reaction pressure of at least about 2000 psi with an aqueous acidic medium containing at least one olefin, and a compound selected from the group consisting of a halogen, a hydrogen halide, a halogen-containing organic compound or metal halide other than those of Group IA and Group IIA metals which can form a halide or a hydrogen halide in the aqueous acidic medium under the process conditions, or mixtures thereof whereby the high boiling organic material and aqueous acidic medium form a substantially single phase system.

4,594,142

DEWAXING WAXY HYDROCARBON OILS USING DI-ALKYL FUMARATE-VINYL LAURATE COPOLYMER DEWAXING AIDS

Biddanda U. Achia; Abraham R. DeKraker, both of Sarnia, Canada, and Albert Rossi, Warren, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 25, 1985, Ser. No. 727,021
Int. Cl.[4] C10G *73/04*
U.S. Cl. 208—33 **4 Claims**

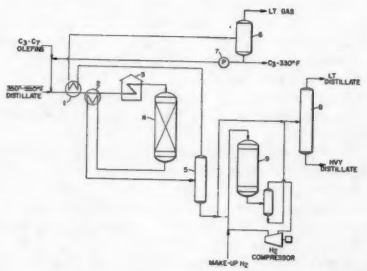
1. A method for dewaxing waxy hydrocarbon oils comprising mixing the waxy hydrocarbon oil feedstock with a dewaxing solvent and a dewaxing aid, said dewaxing aid comprising (A) a dialkyl fumarate-vinyl laurate copolymer having a number average molecular weight of about 30,000 or more, as determined by gel permeation chromatography; and (B) a second component selected from a wax-naphthalene condensation copolymer, dialkyl fumarate-vinyl acetate copolymer or an ethylene-vinyl acetate copolymer, components (A) and (B) being used in a ratio of (A) to (B) of 2/1 to 1/1, chilling the waxy hydrocarbon oil/dewaxing solvent/dewaxing aid combination to precipitate solid particles of wax therefrom, producing a slurry of wax/dewaxed oil dewaxing solvent/dewaxing aid, and separating the wax from said slurry and recovering a dewaxed oil.

4,594,143

PROCESS FOR REACTING LIGHT OLEFINS AND JET FUEL

Samuel A. Tabak, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,287
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—46 **10 Claims**

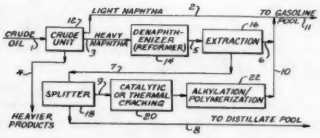


1. A process for upgrading a petroleum fraction having a boiling range of about 300° F. to about 550° F. and which contains at least about 20% by weight aromatics, comprising contacting said petroleum fraction with an olefin stream in the presence of a zeolite catalyst having a pore size of about 6 to about 15 Angstroms and recovering a product stream comprising an olefinic distillate having a boiling range of about 300° F. to less than 550° F. and an alkyl aromatic fraction having a boiling range greater than 550° F.

4,594,144
PROCESS FOR MAKING HIGH OCTANE GASOLINE

Robert B. James, Jr., Northbrook, and Don B. Carson, Mt. Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 14, 1985, Ser. No. 744,824
Int. Cl.[4] C10G 57/00
U.S. Cl. 208—62 8 Claims



1. A process for simultaneously raising the octane number of a gasoline product stream and improving the cetane number and smoke point of a distillate stream, while increasing the total volume of liquid products obtained from a naphtha boiling range charge stock which process comprises the steps of:

(a) separating said charge into a natural gasoline stream comprising a lower boiling point stream essentially free of C_7 paraffins and higher boiling hydrocarbons, and a higher boiling point stream essentially free of C_6 paraffins and lower boiling hydrocarbons;

(b) reacting said higher boiling stream in a reforming reaction zone, at reforming conditions and with a reforming catalyst selected to convert naphthenic hydrocarbons to aromatic hydrocarbons;

(c) separating the resulting reforming effluent stream to recover an aromatic concentrate and a stream rich in C_7 and higher paraffins;

(d) separating said paraffin rich stream to recover a light paraffin stream comprising C_8 paraffins and lower boiling hydrocarbons and a middle distillate product stream comprising C_9 and higher boiling hydrocarbons;

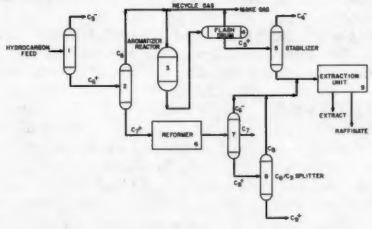
(e) converting at least a portion of the lighter paraffin stream into a high octane gasoline component in a paraffin upgrading zone;

(f) combining at least a portion of the converted light paraffin stream and the aromatic concentrate with the natural gasoline stream to recover a high octane gasoline product stream.

4,594,145
REFORMING PROCESS FOR ENHANCED BENZENE YIELD

John C. Roarty, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 7, 1984, Ser. No. 679,500
Int. Cl.[4] C10G 37/06
U.S. Cl. 208—79 19 Claims



1. A process for reforming a full boiling range hydrocarbon feed to enhance benzene yield comprising:

(a) separating the hydrocarbon feed into a C_5- fraction, a C_6–C_7 fraction containing at least 10% by volume of C_7+ hydrocarbons, and a C_7+ fraction;

(b) subjecting the C_6–C_7 fraction to catalytic aromatization at elevated temperatures in the presence of hydrogen and utilizing a catalyst containing a non-acidic carrier and at least one Group VIII noble metal which catalyst converts C_6 paraffins to benzene in a yield of at least 30% by volume and a selectivity of at least 50% and separating a C_5+ effluent;

(c) subjecting the C_7+ fraction to catalytic reforming at elevated temperatures in the presence of hydrogen utilizing a catalyst comprising platinum on an acidic alumina carrier and separating a C_8- effluent from a C_9+ effluent;

(d) mixing the C_5+ effluent and C_8- effluent from steps (b) and (c) and recovering an aromatic extract and a non-aromatic raffinate.

4,594,146
CONVERSION WITH ZEOLITE CATALYSTS PREPARED BY STEAM TREATMENT

Arthur W. Chester, and Yung-Feng Chu, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 539,497, Oct. 6, 1983, Pat. No. 4,522,929, which is a continuation-in-part of Ser. No. 346,440, Feb. 8, 1982, Pat. No. 4,429,176. This application Dec. 21, 1984, Ser. No. 685,194
The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.
Int. Cl.[4] C10G 11/05, 45/10, 47/18, 47/20
U.S. Cl. 208—111 20 Claims

1. A process for converting feedstock comprising hydrocarbon compounds to conversion product comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst comprising one or more metal promoters selected from the group consisting of platinum, iridium, palladium, nickel, zinc, chromium, copper, rare earth metals and mixtures thereof and a zeolite having a silica/alumina mole ratio greater than 12 and a constraint index of 1 to 12, and wherein said catalyst is steamed in its fresh state under controlled conditions of temperature, time and steam partial pressure so as to initially increase the α-activity of said catalyst and produce a steamed catalyst having a peak α-activity, and subsequently reduce the α-activity from said peak α-activity to an α-activity substantially the same as the α-activity of said fresh catalyst and no more than 25% below the initial α-activity of said fresh catalyst.

4,594,147
CHOLINE AS A FUEL SWEETENER AND SULFUR ANTAGONIST

Glenn L. Roof, Sugar Land; Beth W. Porlier, Missouri City, and Wesley E. Cravey, Friendswood, all of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 16, 1985, Ser. No. 809,652
Int. Cl.[4] C10G 29/00, 29/20
U.S. Cl. 208—207 1 Claim

1. A method of sweetening petroleum hydrocarbon fuels and, at the same time, reducing the sulfur content thereof which comprises treating such fuels with a sweetening and sulfur-removing amount of choline.

4,594,148
EXTRACTION OF AROMATICS WITH ETHYL ACETOACETATE

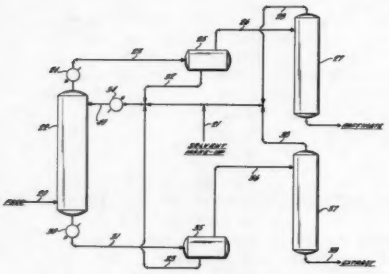
Peter Hosler, Wallingford, Pa., assignor to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 687,706, Dec. 31, 1984, abandoned. This application Feb. 13, 1985, Ser. No. 701,264
Int. Cl.[4] C10G 21/16, 21/28
U.S. Cl. 208—332 15 Claims

1. A liquid phase extraction process for the dearomatization

of a mixed hydrocarbon feed containing aromatic and non-aromatic hydrocarbons comprising:

(a) contacting the mixed feed in an extraction zone with the solvent ethyl acetoacetate at an elevated temperature to provide an aromatic-rich ethyl acetoacetate solvent phase containing said aromatic hydrocarbons, and a raffinate containing primarily non-aromatic hydrocarbons;



(b) recovering and cooling the aromatic-rich solvent phase to form an upper phase comprising an aromatic-rich extract containing solvent and aromatic hydrocarbons, and a lower solvent-rich phase containing primarily said ethyl acetoacetate, and residual hydrocarbons; and

(c) recovering the aromatic hydrocarbons and the raffinate.

4,594,149

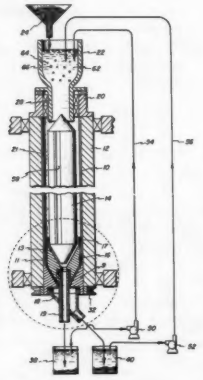
APPARATUS AND METHOD EMPLOYING MAGNETIC FLUIDS FOR SEPARATING PARTICLES

Uri T. Andres, London, United Kingdom; Alan L. Devernoe, and Michael S. Walker, both of Schenectady, N.Y., assignors to Mag-Sep Corp., Guilderland, N.Y.

Filed May 21, 1982, Ser. No. 380,753

Int. Cl.[4] B03B *5/32*; B03C *1/00*

U.S. Cl. 209—1 **3 Claims**



1. A method of separating a collection of particles having a range of densities and such magnetic properties as they may possess into two groups of particles based on the combination of each particle's magnetic property and density, the method comprising the following steps:

(A) establishing along a vertical longitudinal axis and within a confined surrounding coaxial space a flowing stream comprising the particles to be separated in a paramagnetic fluid medium whose density ρ_f is less than that of all of the particles;

(B) establishing with respect to substantially the same axis throughout an elongated separation region of said stream a magnetic field with magnitude which decreases substantially linearly from a point exterior of the flowing stream to the longitudinal axis, said field being of such a configuration as to produce throughout said region substantially only radially directed axisymmetric forces on the medium and the particles;

(C) rotating the stream about its said axis;

(D) performing steps (A),(B) and (C) simultaneously while employing a field strength and speed of rotation such that a substantial net radially outward sum of centrifugal and direct magnetic forces exists on all the particles and such that the radially outward attraction of the paramagnetic fluid by the field provides, additionally, a radially inwardly directed buoyant force on the particles of such magnitude that some of the particles, those having relatively lower combined density and magnetic susceptibility, move inwardly; and

(E) separately collecting the particles having a relatively lower combined density and magnetic susceptibility as a radially inner fraction and the remaining particles as a radially outer fraction and the remaining particles as a radially outer fraction from the stream after it has passed through the separation region.

4,594,150

MONO- AND DITHIOIC ESTERS, THEIR PREPARATION AND USES

Guy Levesque, Caen, and Pierre Tozzolino, Morlaas, both of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Jun. 8, 1984, Ser. No. 618,464

Claims priority, application France, Jun. 10, 1983, 83 09639

Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 **7 Claims**

1. A method of carrying out the flotation of copper, iron, lead or zinc sulfide minerals from an ore, wherein an aqueous pulp of said minerals is added with 10 to 500 grams of a collector per ton of the ore, the collector being constituted by a compound of the formula

$$R-\underset{\underset{S}{\|}}{C}-Y-R'Z$$

where R is an alkyl of 1 to 6 carbon atoms, phenyl or toluyl, Y is S, R' is a straight or branched alkylene group of 1 to 6 carbon atoms, Z is —OH and is located at any position of the alkylene, and then air is bubbled through the pulp and the froth and said sulfide minerals thus formed is recovered.

4,594,151

FLOTATION OF MINERALS

Raymond Delourme, Billere; Jean-Louis Detienne, Pau; Jacques Komornicki, Lescar, and Jacques Tellier, Lons, all of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Division of Ser. No. 541,560, Oct. 13, 1983, Pat. No. 4,526,696. This application May 2, 1985, Ser. No. 729,877

Claims priority, application France, Oct. 13, 1982, 82 17127

Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 **11 Claims**

1. In the process of froth flotation of copper, lead, zinc or molybdenum values from sulfide and oxide ores in which a flotation collector is added to the water containing mineral pulp and said value is recovered in the froth, the improvement which comprises employing a collector composition comprising a compound serving as the flotation collection selected from the group consisting of mercaptan of 8 to 18 carbon atoms and sulfide of the formula RS_xR' in which R and R' individually are alkyl of 1 to 24 carbon atoms and x is 2 to 8, a liquid microemulsion surfactant and a microemulsion co-surfactant which is a 3 to 8 carbon atom alcohol as the source of

the flotation collector, the constituents of said collector composition being present in sufficient proportions as to form a microemulsion.

4,594,152

METHOD AND AN APPARATUS FOR TREATING FIBRE SUSPENSIONS

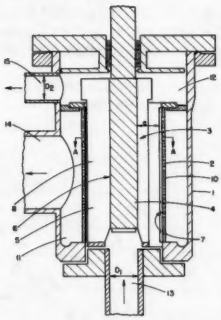
Johan Gullichsen, Siuntio, Finland, assignor to Kamyr AB, Karlstad, Sweden

Continuation of Ser. No. 384,348, Jun. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 170,658, Jul. 21, 1980, abandoned, which is a continuation of Ser. No. 39,396, May 15, 1979, abandoned. This application Aug. 1, 1984, Ser. No. 636,785

Claims priority, application Finland, Jun. 6, 1978, 781789

Int. Cl.⁴ B07B *1/04*

U.S. Cl. 209—273 **8 Claims**



1. An apparatus for fluidizing and screening a fibre suspension of consistency 5–15% to remove therefrom solid foreign particles, which apparatus comprises a housing, an inlet in the housing for receiving inflowing fibre suspension mixed with solid foreign particles; a first outlet in the housing for discharging part of the suspension liquid and said solid foreign particles; a stationary screen positioned in the housing to define a filtering enclosure extending between said inlet and said first outlet, the screen having an inner surface and a plurality of apertures, a rotor disposed within said filtering enclosure for rotation therein to apply to the suspension fluidizing forces breaking up interlocked fibre flocs present therein and thereby fluidizing a part of said suspension to exit therefrom through said screen; a second outlet communicating with the exterior of said screen to allow exit of fluidized suspension; said rotor having a plurality of radially extending planar blades supported by a central shaft, said blades having an outer edge, said blades extending continously towards the inner surface of the screen, from the rotor shaft, said screen having a plurality of radially extending ribs inwardly directed to a predetermined clearance with the outer edge of said radially extending blades, each of said ribs having an outer end, said blades having a height greater than the height of said ribs, the height of the blades being such that said predetermined clearance is sufficient to establish fluidizing forces acting upon the suspension, and wherein said first outlet is approximately the same size as said inlet to accommodate exit of said solid foreign particles.

4,594,153

SEWAGE PUMPING STATION

Frank G. Weis, Kansas City, Mo., assignor to Smith & Loveless, Inc., Lenexa, Kans.

Filed Feb. 21, 1985, Ser. No. 704,075

Int. Cl.⁴ C02F *1/00*

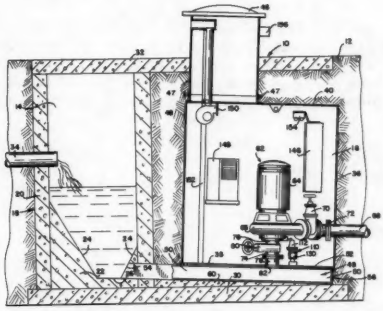
U.S. Cl. 210—104 **9 Claims**

1. A sewage pumping station for pumping sewage from a sewage receiving wet well positioned adjacent thereto, said sewage pumping station comprising:

(a) a machinery chamber defined by a floor and a sidewall extending upwardly from said floor;

(b) said machinery chamber containing sewage pump means supported above said floor;

(c) base beam means positioned immediately below and secured to said floor of sufficient modulus to reinforce said floor against buckling, said base beam means being of



hollow construction so as to define a suction extension conduit having an open first end which extends into and is in fluid communication with a lower portion of said wet well and a closed second end; and

(d) suction conduit means extending between said sewage pump means and said floor, said suction conduit having an upper end in fluid communication with said sewage pump means and a lower end in fluid communication with said suction extension conduit through an opening formed in said floor.

4,594,154

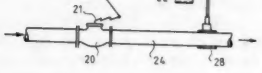
SELF-CONTAINED DEVICE FOR STERILIZING WATER

André Bissardon, Lyons; Jean-Pierre Gourlandt, Le Creusot; Gilles Chastan, Bron, and Marcel Lusseau, Vaulx en Velin, all of France, assignors to CFEC, Paris, France

Filed Aug. 2, 1984, Ser. No. 636,896

Int. Cl.⁴ C02F *1/68*

U.S. Cl. 210—105 **5 Claims**



1. Apparatus for introduction of a sterilizing agent into a water main, said apparatus comprising:

electrically powered injector means, said injector means being connected to said water main and having a first electric control input, said injector means injecting an adjustable quantity of sterilizing agent into the water main in a cycle time interval which is initiated each time a first electrical control signal is applied to said first control input;

electrically powered meter means, mounted in said water main, for continuously measuring the flow of water through the said water main, said meter means having a first electrical signal output and generating a second electrical control signal on said first output each time a prede-

termined volume of water has flown through the said water main; and

electrically powered control means having a second control input connected to the said first signal output, said control means having a second signal output which is connected to the said first control input, said electrically powered control means generating a first control signal on said second signal output each time the said second control signal has been applied to said second control input.

4,594,155

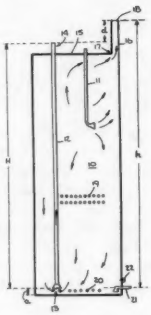
IMMISCIBLE FLUID SEPARATION APPARATUS

Charles S. Conway, Featherbed La., New Vernon, N.J. 07976

Continuation of Ser. No. 433,286, Oct. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 370,111, Apr. 20, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,234

Int. Cl.[4] B01D *23/26*

U.S. Cl. 210—115 **21 Claims**



1. A fluid separation apparatus for separating a mixture of at least two immiscible fluids having different specific gravities, comprising:

an enclosed separation chamber having its volume entirely full with at least two immiscible fluids,

fluid intake means, coupled to said separation chamber, for admitting said mixture of fluids to said chamber,

first vertically-disposed, elongated fluid column means extending into said chamber and opening at one end adjacent the bottom thereof, the opposite end of said fluid column means extending vertically above the top of said chamber and opening exteriorly thereof above the top of said chamber for permitting the discharge from said chamber of the immiscible fluid of said mixture having the greater specific gravity, said fluid column means having a predetermined length H between the end thereof opening adjacent to said bottom of said chamber and said opposite end thereof and wherein said first fluid column means is completely filled from said opening adjacent to said bottom to said opposite end defined by H with said fluid having the greater specific gravity to produce a hydrostatic head for effecting the separation and wherein said first fluid column means has no fluid communication opening intermediate said one end and said opposite end,

second extended fluid column means extending vertically upwardly from the top of said chamber, a lower end of said second extended fluid column means opening into said chamber at an upper portion of said chamber, and an upper, open end thereof extending vertically above said opposite end of said first extended fluid column means by a distance d which is approximately equal to $H(S_w/S_c-1)$, where S_w represents the specific gravity of said immiscible fluid having the greater specific gravity and S_c represents the specific gravity of the other of said fluids of said mixture and wherein said second fluid column means is completely filled with said other fluids between said lower end and said upper end as defined by d and wherein said second fluid column means has no fluid communication opening intermediate said lower end and said upper end,

means for adjusting d responsive to H, S_w and S_c for controlling the quality of the separation,

first fluid discharge means coupled to said open, opposite end of said first fluid column means for discharging said fluid of the greater specific gravity from said first fluid column means at approximately zero back pressure,

second fluid discharge means coupled to said upper, open end of said second fluid column means for discharging said other fluids from said second fluid column means at approximately zero back pressure.

4,594,156

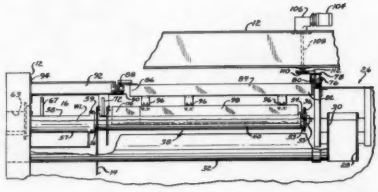
MOTORIZED SURFACE SCUM SKIMMER FOR WASTE WATER TREATMENT APPARATUS

Peter Grujanac, Bartlett, and Clyde Huntington, Elgin, both of Ill., assignors to Lakeside Equipment Corporation, Bartlett, Ill.

Filed Jul. 5, 1985, Ser. No. 752,073

Int. Cl.[4] B01D *21/06*

U.S. Cl. 210—145 **8 Claims**



1. A clarifier for waste water comprising:

a vessel having a generally circular side wall;

a peripheral skirt within said vessel and spaced from but within proximity to said side wall;

means for introducing waste water into said vessel between said skirt and said side wall;

means generally centrally of said vessel defining an effluent collector;

an upstanding baffle surrounding said effluent collector and adapted to project above and below the intended level of waste water in said vessel to prevent floatables between said skirt and said baffle from moving to said effluent collector;

an elongated scum trough having a lengthwise opening in one side extending between, and journalled and supported solely by said skirt and said baffle so as to be rotatable about a generally horizontal axis approximately at the intended level of waste water in said vessel;

a scum pipe showing a lengthwise opening disposed between and journalled by said side wall and said skirt so as to be rotatable about said generally horizontal axis approximately at the intended level of waste water in said vessel so that said scum pipe and said scum trough are generally concentric;

said scum pipe being rotatable independently of said scum trough and vice versa;

one end of said scum pipe being in fluid communication with the adjacent end of said scum pipe through said skirt;

a scum pit associated with said vessel adjacent said scum pipe;

the other end of said scum pipe being in fluid communication with said scum pit;

a pair of means, one for each of said scum pipe and scum trough, for independently and selectively rotating the associated pipe or trough about said generally horizontal axis; and

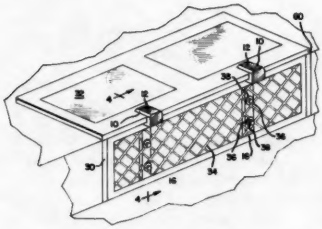
a travelling structure extending between said skirt and said baffle including a depending skimming blade for engaging floatables between said skirt and said baffle and moving the same to and depositing them in said scum trough.

4,594,157

INLET CLAMP AND SCREEN

Bernard J. McGowan, 657 Thayer St., Philadelphia, Pa. 19134

Filed Dec. 31, 1984, Ser. No. 688,023
Int. Cl.[4] E01F *5/00*
U.S. Cl. 210—163 **20 Claims**



1. An inlet clamp for affixing to a cover over a sewer inlet above a surface comprising

a generally F-shaped bracket having a vertical leg and a pair of interconnected upper and lower horizontal legs affixed to the vertical leg,

the inlet clamp extending in height from the inlet cover to the surface; and,

securing means positioned in one of the horizontal legs to affix the bracket to the inlet cover.

4,594,158

FILTER AID MATERIALS BEARING ANION EXCHANGE RESINS

Berni P. Chong, Dresher, and Eric G. Isacoff, Richboro, both of Pa., assignors to Rohm and Haas, Philadelphia, Pa.

Filed Sep. 3, 1981, Ser. No. 298,866
Int. Cl.[4] B01D *37/02*
U.S. Cl. 210—193 **8 Claims**

1. An improved filter comprising as a precoat layer a floc of finely divided anion exchange resin and cation exchange resin, and an overcoat layer deposited thereon, the overcoat layer comprising a filter aid and coated irremovably upon the surface thereof, by electrostatic bonding, finely divided anion exchange resin particles having an average particle diameter between about 0.05 and about 1 micrometer.

4,594,159

PROCESS AND APPARATUS FOR APPLYING BACK PRESSURE IN A LIQUID CHROMATOGRAPHY SYSTEM

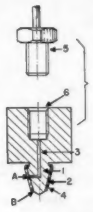
Ralph I. Stalberg, Upsala, Sweden, assignor to Pharmacia AB, Upsala, Sweden

Filed Nov. 1, 1984, Ser. No. 667,155
Claims priority, application Sweden, Nov. 17, 1983, 8306332
Int. Cl.[4] B01B *15/08*
U.S. Cl. 210—198.2 **4 Claims**

1. In a liquid chromatography system that includes an outlet passageway for the removal of liquid from said system, the improvement consisting of

(a) an outlet passageway that is discontinuous to the extent that it has a first section that has a first outlet and a second section that has an inlet and a second outlet, and

(b) an elastic envelope that always extends over and presses toward both said first outlet and the inlet to said second section, said elastic envelope being sufficiently elastic so that when the pressure of the liquid against the interior of said envelope reaches a predetermined value the elastic envelope will be forced outwardly from said first outlet and form a channel along the inner surface of the elastic



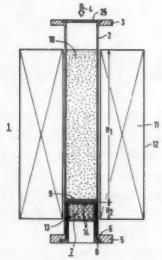
envelope to said inlet of said second section so as to permit the flow of liquid between said first outlet and the inlet of said second section.

4,594,160

MAGNETIZABLE SEPARATOR FOR THE PURIFICATION OF LIQUIDS

Hans-Günter Heitmann, Erlangen, and Günter Rupp, Marloffstein-Rathsberg, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Müheim, Fed. Rep. of Germany

Continuation of Ser. No. 521,704, Aug. 9, 1983, abandoned. This application Feb. 27, 1985, Ser. No. 706,235
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1982, 3229927
Int. Cl.[4] B01D *35/06*
U.S. Cl. 210—222 **3 Claims**



1. Magnetic separator for the purification of liquid having suspended therein magnetizable particles which comprises

(a) a vertical tube for flow downwardly therethrough of said liquid,

(b) magnetizable balls contained in the tube in a flow direction of the liquid over a major part of the tube length,

(c) a plurality of magnetizable wire screens stacked on top of each other contained in the tube following said balls over a minor part of the tube length,

(d) said wire screens having wire thicknesses of several hundredth to several thousandths of the ball diameters,

(e) said wire screens arranged in a separately detachable insert which protrudes into the tube from a downstream end facing away from the balls, said insert having an outward extending flange on the end of the insert opposite the other end which protrudes into the tube,

(f) a common coil for magnetizing both the balls and the wire screens surrounding the tube portion which encloses both the balls and the wire screens, and

(g) a common flushing line connected to the downstream end of the tube for flushing both the wire screens and the balls in the same flushing operation by reverse flushing by

flowing a flushing liquid through the magnetic separator from the bottom up, first cleaning the wire screens then whirling-up the balls to loosen impurities thereon and suspend the impurities in the flushing liquid, and discharging the flushing liquid containing suspended solids from the top of the tube.

4,594,161

REVERSE OSMOSIS SEALING MEANS

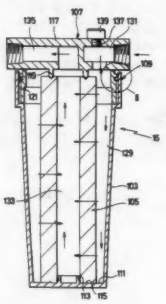
Hideo Goto, Koshigaya, Japan, assignor to Yamato Scientific Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1983, Ser. No. 539,254

Claims priority, application Japan, Oct. 15, 1982, 57-155083[U]

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—433.2 **4 Claims**



1. A reverse osmosis device for purifying raw water comprising:

a generally cylindrical body having one end closed and the other end opened, said cylindrical body formed with a female thread on the inner periphery of said opened end,

a filter means provided within said cylindrical body, said filter means being of elongated annular shape and forming with said cylindrical body a peripheral region to be filled with raw water and a central region for receiving water through said filter from said peripheral region,

a cover member mounted on said opened end of said cylindrical body and defining an inlet in communication with said peripheral region and an outlet in communication with said central region, said cover member comprising an axially extending annular flange which is provided on its outer surface with a male thread engaged with the female thread on the inner periphery of said opened end of the cylindrical body, said annular flange being formed with a radially extending annular projection on its outer surface at a position displaced from the male thread toward the opened end of said cylindrical body; and

a flexible annular seal member mounted on the outer surface of said annular flange in contact with a surface of the annular projection which faces said male threads, said seal member having a ring-like concavity toward which the fluid pressure of said cylindrical body is applied and being shaped so as to be urged against the annular projection and the outer surface of said annular flange and the inner periphery of the opened end portion of said cylindrical body by fluid pressure inside said cylindrical body to render the seal member effective when the inside of said cylindrical body is subjected to high pressure.

4,594,162

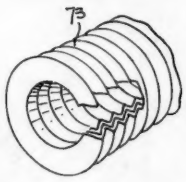
PLEATED FILTER AND METHOD AND APPARATUS FOR FABRICATING SAME

Richard M. Berger, Richmond, Va., assignor to American Filtrona Corporation, Richmond, Va.

Filed Feb. 13, 1984, Ser. No. 579,761

Int. Cl.[4] B01D *27/06*

U.S. Cl. 210—493.1 **44 Claims**



1. A filter for physically separating constituent components of a fluid, said filter comprising: a sheet-like member having a plurality of adjacent layers, each layer being porous to at least one constituent component of said fluid, at least one of said layers being generally impervious to a second constituent component of said fluid, said sheet-like member being in the form of a hollow peripherally integral and continuous tube having a longitudinal tube axis and a multiplicity of successively adjacent pleats having fold edges oriented generally transversely of said longitudinal tube axis;

said sheet-like member being a substantially solid, dimensionally stable body;

said at least one of said layers which is generally impervious to said second constituent having a thickness; each of said pleats having a length; each pair of adjacent pleats being separated by a distance by material from ones of said layers which are adjacent to said at least one of said layers which is generally impervious to said second constituent;

a ratio of said length to said distance being at least 10:1.

4,594,163

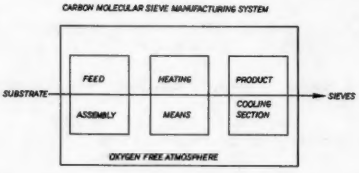
USE OF CARBON MOLECULAR SIEVES FOR SEPARATING GAS OR LIQUID MIXTURES

Robert F. Sutt, Jr., Johnstown, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Division of Ser. No. 561,012, Dec. 13, 1983, Pat. No. 4,540,678, and a continuation-in-part of Ser. No. 415,103, Sep. 7, 1982, abandoned. This application Mar. 7, 1985, Ser. No. 709,271

Int. Cl.[4] B01D *53/02, 15/04;* C10G *25/00;* C02F *1/42*

U.S. Cl. 210—660 **1 Claim**



1. A process for separating gas or liquid mixtures containing components of at least two different molecular shapes, comprising passing the liquid or gas through a molecular sieve having:

(a) an apparent density of from 0.60 to 0.70 g/cc,

(b) an oxygen diffusivity ($X\ 10^{-8}$) of from 500 to 900 cm^2/sec,

(c) an oxygen/nitrogen selectivity ratio of from 5.0 to 8.5,

(d) an oxygen capacity of from 4.00 to 6.00 cc/cc, and

(e) an average effective pore diameter of about 3 to 5 Angstroms,

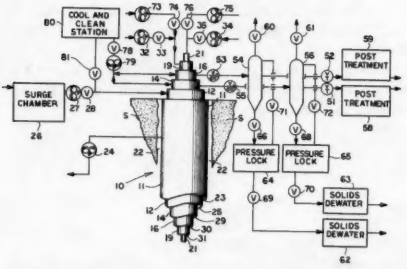
wherein the carbonaceous adsorbent sieve is prepared by continuously feeding a charred naturally occurring substrate and heating said substrate under non-activation conditions, without the use of an externally added pore blocking substance, at a temperature range of about 900° F. (482° C.) to 2000° F. (1093° C.) for a time period of about 5 to 90 minutes.

4,594,164

METHOD AND APPARATUS FOR CONDUCTING CHEMICAL REACTIONS AT SUPERCRITICAL CONDITIONS

James A. Titmas, 4380 Norona Dr., Stow, Ohio 44224

Filed May 23, 1985, Ser. No. 737,162
Int. Cl.[4] C02F *1/02, 1/38, 1/72*
U.S. Cl. 210—741 **39 Claims**



1. A method of treating a continuously flowing water contaminated with organic and inorganic materials comprising the steps of feeding the contaminated water into the top of a hydraulic downdraft column; conducting the contaminated water from the bottom of said downdraft column into a reaction chamber; providing sufficient heat energy in said reaction chamber to maintain the temperature of the contaminated water at approximately the temperature necessary to create supercritical water conditions; maintaining the pressure in said reaction chamber at approximately the pressure necessary to create supercritical water conditions; said heat energy and pressure causing a chemical reaction to take place in said reaction chamber resulting in treated water, including at least water, particulates and precipitates, of a lower specific gravity; imparting centrifugal force to the treated water to divide the treated water into a particulate and precipitate enriched portion and a particulate and precipitate depleted portion; conducting one portion of the treated water into the bottom of a first hydraulic updraft column and the other portion of the treated water into the bottom of a second hydraulic updraft column whereby the pressure at the bottom of said updraft columns causes the portions of the treated water to rise separately in said updraft columns; and removing the portions of the treated water from the top of said updraft columns.

4,594,165

METHOD OF ENHANCING SEPARATION OF ABNORMALLY LIGHT RED CELLS FROM GRANULOCYTES IN A CENTRIFUGED BLOOD SAMPLE

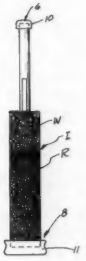
Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437, and Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405

Filed Nov. 16, 1984, Ser. No. 671,934
Int. Cl.[4] B01D *21/26*
U.S. Cl. 210—767 **4 Claims**

1. A method for forming an interface of increased clarity between red cells and white cells in a centrifuged sample of anticoagulated blood, said method comprising the steps of:

(a) drawing a sample of anticoagulated blood into a capillary tube;

(b) closing one end of said capillary tube;



(c) centrifuging said blood sample in said capillary tube so as to cause red cells in said sample to aggregate at said one end of said capillary tube;

(d) closing the opposite end of said capillary tube;

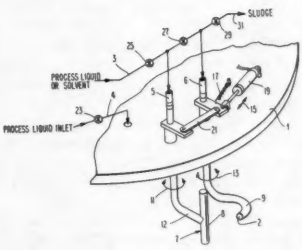
(e) inverting said sample, and re-centrifuging so as to cause said aggregated red cells to migrate toward said opposite end of said capillary tube in a column.

4,594,166

DESLUDGING DEVICE FOR CENTRIFUGES

William D. Clinton, 313 Custis Rd., Glenside, Pa. 19038, and Donald J. Hess, Willow Grove, Pa., assignors to William D. Clinton, Glenside, Pa.

Filed Mar. 25, 1985, Ser. No. 715,926
Int. Cl.[4] B04B *11/00, 15/06*
U.S. Cl. 210—107 **16 Claims**



12. Apparatus for removing sludge from a centrifuge, comprising:

(a) a sludge re-slurrying tube and a sludge discharge tube, the re-slurrying tube terminating in a nozzle means, the nozzle means being positioned to direct fluid in the general direction of the sludge,

(b) means for directing fluid from the discharge tube into the re-slurrying tube,

(c) means for moving the re-slurrying tube and the discharge tube towards the wall of the centrifuge, and

(d) means for automatically stopping movement of the re-slurrying tube and discharge tube, and for removing slurry from the centrifuge.

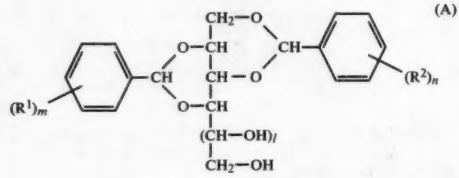
4,594,167
FOAM FIRE-EXTINGUISHING COMPOSITION

Toshiaki Kobayashi, Kyoto; Shizuo Terasawa, Kashihara; Giichi Akazome, Kyoto, and Koichi Murai, Nagaokakyo, all of Japan, assignors to New Japan Chemical Co., Ltd., Japan

PCT No. PCT/JP82/00391, § 371 Date May 22, 1984, § 102(e) Date May 22, 1984, PCT Pub. No. WO84/01302, PCT Pub. Date Apr. 12, 1984
PCT Filed Sep. 27, 1982, Ser. No. 617,086
Int. Cl.[4] A62C 1/12; A62D 1/02; C09K 3/00
U.S. Cl. 252—3 4 Claims

1. A foam fire-extinguishing composition comprising:

(a) 0.3 to 15% by weight of at least one compound represented by the formula



wherein R^1 and R^2 are the same or different and are each hydrogen atom, alkyl or alkoxy group having 1 to 3 carbon atoms, l is 0 or 1, and m and n are an integer of 1 to 3, with the proviso that when R^1 and R^2 are alkoxy, m and n are 1;

(b) 1 to 30% by weight of a surfactant selected from the group consisting of alkyl sulfate, alkyl ether sulfate, olefin sulfonate, alkylbenzenesulfonate, fatty acid soap, quaternary ammonium salt, amine oxide, polyoxyethylene alkyl ether, sorbitan fatty acid ester, polyoxyethylene alkyl phenyl ether, fatty acid alkylolamide, fatty acid amide, saccharose esters of fatty acid, alkyl imidazoline salt and fluorine-containing surfactant;

(c) 0.5 to 20% by weight of at least one member selected from aliphatic monohydric alcohol having 1 to 14 carbon atoms, ethylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, propylene glycol, dipropylene glycol, tripropylene glycol, tetrapropylene glycol, glycerin, diglycerin, triglycerin, ethylene glycol methyl ether, ethylene glycol ethyl ether, diethylene glycol methyl ether, diethylene glycol ethyl ether, diethylene glycol butyl ether, triethylene glycol methyl ether and ethylene carbonate and/or 0.1 to 5% by weight of a water-soluble polymer selected from the group consisting of polyethylene glycol having a molecular weight of about 5,000 to 200,000, polypropylene glycol having a molecular weight of about 2,000 to about 150,000 carboxymethyl cellulose, methyl cellulose, hydroxypropyl cellulose, polyvinyl alcohol having a polymerization degree of about 300 to about 2,700, polyvinyl pyrrolidone having a polymerization degree of about 100 to about 2,000, polyacrylamide having a polymerization degree of about 100 to about 2,500, vinyl acetate-vinyl pyrrolidone copolymer having a molecular weight of about 5,000 to about 200,000 and polyethylene imine having a molecular weight of about 5,000 to about 200,000;

(d) 1 to 50% by weight of a polar organic solvent which is a good solvent of the component (a) and which is selected from the group consisting of N-methyl-2-pyrrolidone, N-vinyl-2-pyrrolidone, N-isopropyl-2-pyrrolidone, N-cyclohexyl-2-pyrrolidone, cyclohexanone, dimethyl sulfoxide, sulfolane, morpholine, N,N-dimethylfomamide, N,N-dimethylacetamide and N,N-dimethylacrylamide; and

(e) 50 to 97% by weight of water.

4,594,168
DERIVATIVES OF LIGNOSULFONIC ACID

Jean-Louis Dupin, Tartas, France, assignor to L'Avebene, Paris, France

Continuation of Ser. No. 557,380, Dec. 1, 1983, abandoned, which is a continuation of Ser. No. 235,752, Feb. 18, 1981, abandoned. This application Jan. 17, 1985, Ser. No. 692,856
Claims priority, application France, Feb. 27, 1980, 80 04351; Jan. 29, 1981, 81 01695
Int. Cl.[4] C08H 5/02; C09K 7/02
U.S. Cl. 252—8.5 C 5 Claims

1. A process for the preparation of lignosulfonic acid derivatives which comprises:

(a) heating in a pressure and corrosion resistant closed container for a period of about 1 to 30 minutes, at temperatures within a range of 115° C. to 160° C., a mixture of a lignosulfonic acid aqueous solution having a pH lower than 3, containing from 100 g to 600 g of the acid per liter, and an inorganic oxidizing agent selected from the group consisting of hydrogen peroxide, ozonized oxygen, alkaline chlorites and alkaline hypochlorites, supplying 0.5 to 2 g oxygen per 200 g lignosulfonic acid to form a reacted mixture, and

(b) neutralizing said reacted mixture with an alkaline solution to a pH at least equal to 5 to obtain a mixture containing transformed lignosulfonic acid.

4,594,169
DRILLING FLUID ADDITIVES

Yoshizi Saito; Masaru Nakamura; Toyoshi Iida, all of Gunma, and Tsugunori Honda, Ichikawa, all of Japan, assignors to Japan Metals and Chemicals Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 678,840
Claims priority, application Japan, Jun. 22, 1984, 59-128972
Int. Cl.[4] C09K 7/02
U.S. Cl. 252—8.5 C 2 Claims

1. A drilling fluid additive, comprising:

complex compounds of nitro-humic acids and lignosulfonates and compounds of metals zirconium, nickel and iron, said compounds of metals being sulfates, nitrates, halides, carbonates and hydroxides of said metals, wherein the contents of said metals in said additive are 1.3 to 2.5% of zirconium, 0.8 to 1.5% of nickel and 0.8 to 1.5% of iron, the total metal content being 3.0 to 5.5% of said drilling fluid additive.

4,594,170
METHOD FOR LIQUIFYING CHLORIDE-BASED HEAVY BRINE WELL COMPLETION FLUIDS

Richard A. Brown, Trenton; Robert D. Norris, Cranbury, and Joseph C. Richards, Robbinsville, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 25, 1984, Ser. No. 624,423
Int. Cl.[4] C09K 7/00, 7/04
U.S. Cl. 252—8.55 R 6 Claims

1. A method to liquify a chloride-based heavy brine completion fluid having a density greater than about 90 kg/m^3 consisting essentially of incorporating into the completion fluid a sufficient amount of hydrogen peroxide and of a persulfate so that the hydrogen peroxide:persulfate mol ratio is between 9:1 and 1:9 and the combined hydrogen peroxide and persulfate content of the completion fluid is at least 1 millimol per liter, thereby liquifying the completion fluid absent added acceleration agents.

4,594,171

FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 265,301, May 20, 1981, Pat. No. 4,478,732. This application Jun. 26, 1984, Ser. No. 624,563

Int. Cl.[4] C10M *133/46, 141/06, 141/12*

U.S. Cl. 252—49.6 **12 Claims**

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease or other solid lubricant prepared therefrom and a minor effective amount of a multifunctional additive selected from

borated mixed ethoxylated hydrocarbyl amines-hydrolyzed hydroxyalkly or hydroxyalkenyl hydrocarbyl imidazolines;

and various combinations of these wherein each compound has from about 1 to about 30 carbon atoms havng one or more double bonds, one or more halogen or sulfur atoms or aromatic rings or is alkyl or substituted alkyl.

4,594,172

PROCESS FOR THE PREPARATION OF HYDROCARBONS

Swan T. Sie, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 27, 1985, Ser. No. 706,437

Claims priority, application Netherlands, Apr. 18, 1984, 8401253

Int. Cl.[4] C10M *7/16*

U.S. Cl. 252—55 **18 Claims**

1. A process for the preparation of a high-viscosity-index lubricating oil, wherein a feed mixture of carbon monoxide and hydrogen is converted into a mixture of hydrocarbons substantially consisting of linear paraffins, by contacting said feed mixture at elevated temperature and pressure with a catalyst comprising 3–60 pbw of cobalt and0.1–100 pbw of at least one other metal selected fom the group consisting of zirconium, titanium and chromium per 100 pbw of silica, alumina or silica-alumina carrier, which catalyst has been prepared by kneading and/or impregnation, that from the mixture of paraffins thus prepared a light fraction is separated which consists substantially of C_{10}–C_{19} paraffins, and that at least part of said light fraction is converted into a product comprising the desired high-viscosity-index lubricating oil by treating it at an elevated temperature with a peroxide of the general formula $R\text{-}O\text{-}O\text{-}R^1$, wherein R and R^1 represent alkyl, aryl or acyl moieties.

4,594,173

INDIUM DOPED GALLIUM ARSENIDE CRYSTALS AND METHOD OF PREPARATION

Hudson M. Hobgood; Richard N. Thomas, both of Murrysville, and Donovan L. Barrett, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1984, Ser. No. 602,236

Int. Cl.[4] C30B *15/04;* **H01L** *29/14*

U.S. Cl. 252—62.3 GA **6 Claims**

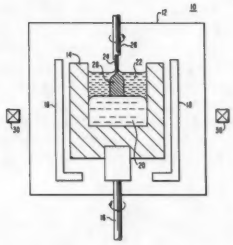
1. A method of fabricating a large diameter, long single crystal of semi-insulating, indium-doped gallium arsenide which exhibits low dislocation structure, which crystal is grown by liquid encapsulant Czochralski processing comprising:

(a) providing an initial melt of elemental gallium, indium, and arsenic, in which the indium is present in an amount of about 1 to 2 atom percent of the gallium and arsenic, with a slight excess of arsenic over a stoichiometric ratio with respect to gallium present;

(b) heating the initial melt to form indium-doped gallium arsenide and maintaining a predetermined thermal gradient characteristic in the melt along the axial direction of crystal pull;

(c) pulling at a predetermined rate a single crystal of indium-doped gallium arsenide from the fluid melt, forming the crystal at the melt face with the indium concentration being about 5×10^{19} to 3×10^{20} indium atoms per cubic centimeter which is uniformly distributed through the single crystal with the segregation coefficient of indium in gallium arsenide being about 0.1, with the ratio of gallium and indium to arsenic being approximately stoichiometric.

5. A large diameter, long single crystal of semi-insulating indium-doped gallium arsenide exhibiting a low dislocation



structure, which crystal is grown by liquid encapsulant Czochralski processing in which the gallium, indium, and arsenic are supplied in elemental form in the starting melt, with the indium present in the melt in an amount of about 1 to 2 atom percent of the gallium arsenide, with a slight excess of arsenic over a stoichiometric ratio with respect to gallium present in the starting melt, and the single crystal having an approximately stoichiometric ratio of gallium and indium to arsenic, and an indium concentration of approximately 5×10^{19} to 3×10^{20} indium atoms per cubic centimeter.

4,594,174

MAGNETIC PAINT FOR MAGNETIC RECORDING MEDIA

Akira Nakayama, Yokosuka; Katsuya Nakamura, Tokyo; Kotaro Hata, Ichikawa, and Makoto Yamamoto, Hiratsuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,335

Claims priority, application Japan, Aug. 22, 1984, 59-174400

Int. Cl.[4] C04B *35/04;* **C07F** *9/02*

U.S. Cl. 252—62.54 **9 Claims**

1. A magnetic paint for use in magnetic recording media comprising a magnetic powder and as a binder therefor, a copolymer resin having a bonded carboxyl group content of 0.3 to 5.0% by weight, a bonded epoxy group content of at least 0.5% by weight, and a vinyl chloride unit content of at least 60% by weight.

4,594,175

MECHANICAL DISHWASHING RINSE COMPOSITION HAVING A LOW FOAMING SULFONIC ACID RINSING AGENT, A HYDROTROPE AND A SOURCE OF ACTIVE HALOGEN

James L. Copeland, Burnsville, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Aug. 29, 1984, Ser. No. 646,256

Int. Cl.[4] C11D *7/18*

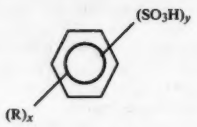
U.S. Cl. 252—99 **9 Claims**

1. A low-foaming and sanitizing or bleaching rinse solution for machine warewashing which consists essentially of:

(a) an aqueous medium;

(b) about 0.5 to 10 weight percent of an active-halogen composition;

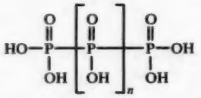
(c) about 0.5 to 10 weight percent of a low-foaming sulfonate rinse agent having the formula:



and the alkali or alkaline earth metal salts thereof wherein each x is independently an integer of 1 to 4, each y is independently an integer of 1 to 4, the sum of x and y are less than or equal to 5 and each R is independently a hydrocarbyl group containing from 3–6 carbon atoms;

(d) about 0.5 to 12 weight percent of xylene sufonate.

(e) about 0.1–15 weight percent of threshold agent selected from the group consisting of N-hydroxyethylaminodiacetic acid, and its mono, di, tri and tetrasodium salts, maleic anhydride, polyacrylic acid or polymethacrylic acid, homo or interpolymers and mixtures thereof and condensed phosphates having the following general formula:



wherein, n is greater than or equal to 1 preferably n=1 to 4, and the alkali metal or alkaline earth metal salts thereof.

4,594,176
POLYALKYLENE POLYAMINE-GLYCOL ACCELERATORS FOR PAINT REMOVAL COMPOSITIONS

Dennis F. Mahoney, Hastings, and William V. Block, Apple Valley, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Continuation of Ser. No. 603,679, Apr. 25, 1984, Pat. No. 4,537,705. This application Jun. 13, 1985, Ser. No. 744,398
Int. Cl.[4] C11D *7/14, 7/52*
U.S. Cl. 252—153 **8 Claims**

1. A composition comprising a mixture of about one part by weight of a polyalkylene polyamine of the formula:

$$(R_1)(R_2)NXN(R_1)(R_2)$$

wherein R_1 and R_2 are selected from the group consisting of hydrogen, (lower)alkyl and $[CH_2CH(Y)O]_mH$, wherein Y is hydrogen or lower alkyl and m is about 1–4; and X is a polyoxy(lower)alkylene moiety or C_2–C_6 alkylene; and (b) about 1–3 parts by weight of a glycol compound comprising a (lower-)alkylene glycol (lower)alkyl ether, a (lower)alkylene glycol phenyl ether, and mixtures thereof; wherein said mixture is effective as an accelerator when added to alkali metal hydroxidebased paint stripping baths.

4,594,177
SURFACE DEMOISTURIZING COMPOSITION AND USE THEREOF

André Lantz, Domaine de la Hêtraie, Vernaison, France (69390); Henri Mathais, Villa No. 2, Chemin de l'Indiennerie, France (69370), and Gérard Dupuis, 34, rue Auguste Blanche, Puteaux, France (92800)

Filed Feb. 22, 1983, Ser. No. 468,499
Claims priority, application France, Feb. 23, 1982, 82 02923
Int. Cl.[4] C09K *3/00;* C11D *1/62*
U.S. Cl. 252—194 **24 Claims**

1. A demoisturizing composition for the displacement of liquid water comprising a chlorofluorocarbon having at least two carbon atoms that is liquid at room temperature, a sufficient amount of a surfaceactive agent dissolved therein so as to impart water displacement characteristics to the composition, said surface-active agent corresponding to the formula:

$$R_2\overset{\oplus}{N}R'_2\,(R''O)_p(OH)_{2-p}PO_2^{\ominus}$$

in which

R is an alkyl group containing 6 to 18 carbon atoms;

R′ is an alkyl group containing 1 to 2 carbon atoms;

R″ is an alkyl group containing 1 to 18 carbon atoms; and

p is a value ranging between 1 and 2 and wherein said surface-active agent is prepared by mixing the following compounds:

$$R_2\overset{\oplus}{N}R'_2Cl^{\ominus} \quad (1)$$

$$(R''O)_p(HO)_{2-p}PO_2H, \text{ and} \quad (2)$$

(3)

where R_f represents a straight or branched perfluorinated alkyl chain of formula C_qF_{2q+1} in which q is a whole number ranging between 2 and 20 and where X is a divalent bond group, which can be partially halogenated, and R_1 and R_2 represent a hydrogen atom, an alkyl radical or a hydroxyalkyl radical, containing less than six carbon atoms, and wherein

is at least partially present as a soluble hydrochloride.

14. The process of removing water from a surface which comprises contacting the surface with a demoisturizing composition according to claim 1.

4,594,178
PROCESS FOR PRODUCING A YELLOW EMITTING PHOSPHOR

Romano G. Pappalardo, Sudbury, and John Walsh, Milford, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 511,603, Sep. 12, 1983, abandoned, which is a continuation of Ser. No. 373,330, Apr. 30, 1982, abandoned. This application Mar. 18, 1985, Ser. No. 713,578
Int. Cl.[4] C09K *11/463*
U.S. Cl. 252—301.4 P **2 Claims**

1. A process for making a yellow emitting fluorescent lamp phosphor comprising the following steps:

Step-1 firing a mixture of $SrHPO_4$, $SrCO_3$ SrF_2, CeF_3 and $MnCO_3$ formulated as $Sr_{4.32}Ce_{0.3}Mn_{0.25}(PO_4)_{3.05}F_{1.95}$ for about 1 hour at about 950° C. in about 10 liters/minute flow of N_2 containing about 5% H_2 to form a fired material;

Step-2 grinding said fired material from Step 1 to form a ground fired material;

Step-3 sieving said ground fired material from Step 2 to form a sieved-ground fired material; and

Step-4 firing said sieved-ground fired material from Step 3 for about 1 hour at about 1025° C. in about 10 liters/minute flow of N_2 to form said yellow-emitting phosphor.

2. A process for making a yellow emitting fluorescent lamp phosphor comprising the following steps:

Step-1 firing a mixture of $CaHPO_4$, $CaCO_3$, CeF_3, $MnCO_3$

and NH_4HF_2 formulated as $Ca_{4.17}Ce_{0.3}Mn_{0.25}(PO_4)_{3.0}F_{3.2}$ for about 1 hour at about 1050° C. in about 10 liters/minute flow of N_2 containing 5% H_2 to form a fired material; and

Step-2 firing said fired material from Step 1 for about 1 hour at about 950° C. in about 10 liters/minute flow of N_2 containing 5% H_2 to form said yellow emitting phosphor.

4,594,179

REDUCTION OF REABSORPTION EFFECTS IN SCINTILLATORS BY EMPLOYING SOLUTES WITH LARGE STOKES SHIFTS

Larry A. Harrah, and Clifford L. Renschler, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 1, 1984, Ser. No. 636,655

Int. Cl.⁴ C09K *11/06*

U.S. Cl. 252—301.17 **18 Claims**

1. In a radiation or high energy particle responsive system useful as a scintillator, and comprising,

a first component which interacts with said radiation or high energy particle to emit photons in a certain first wavelength range; and

at least one additional solute component which absorbs the photons in said first wavelength range and thereupon emits photons in another wavelength range higher than said first range;

the improvement wherein at least one of said components absorbs substantially no photons in said wavelength range in which it emits photons, due to a large Stokes shift caused by an excited state intramolecular rearrangement, with the proviso that said component having a large Stokes shift is not methyl salicylate or salicylic acid.

4,594,180

PROCESS FOR PRODUCING ELECTRICALLY CONDUCTIVE HIGH POLYMER OF ACETYLENE

Yukio Kobayashi; Hideki Shirakawa, both of Yokohama, and Sakuji Ikeda, Tokyo, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Division of Ser. No. 224,518, Nov. 29, 1980, Pat. No. 4,487,709. This application Oct. 3, 1984, Ser. No. 657,266

Claims priority, application Japan, Mar. 29, 1979, 54-36284; Mar. 29, 1979, 54-36285; Mar. 29, 1979, 54-36286; Mar. 29, 1979, 54-36287; Apr. 24, 1979, 54-49734; Apr. 25, 1979, 54-50245

Int. Cl.⁴ H01B *1/00*

U.S. Cl. 252—500 **1 Claim**

1. A process for producing an electrically conductive acetylene high polymer, which comprises doping an acetylene high polymer having a fibrous microcrystalline structure with at most 300 parts by weight of an electron acceptor compound per 100 parts by weight of the polymer, said electron acceptor compound being a compound of the formula $R'—SO_3—R''$, wherein R' represents Cl, F or a halogen-substituted hydrocarbon having not more than 5 carbon atoms, and R'' represents alkyl having not more than 5 carbon atoms.

4,594,181

METAL OXIDE-COATED COPPER POWDER

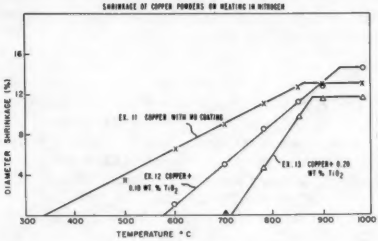
Vincent P. Siuta, Cherry Hill, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 17, 1984, Ser. No. 651,081

Int. Cl.⁴ C09D *5/24;* H01B *1/02, 1/08*

U.S. Cl. 252—512 **4 Claims**

1. A printable thick film conductive composition comprising a dispersion in an organic medium of the particles of Cu-containing metal having sintering and shrinkage characteristics which more closely match those of green ceramic tape, bearing a substantially continuous coating of at least one metal oxide having a free energy of formation more negative than −98 kcal/mole and having a particle size of 0.5–20 μm in largest dimension and a surface area less than 1.0 m^2/g.


SHRINKAGE OF COPPER POWDERS ON HEATING IN NITROGEN
DIAMETER SHRINKAGE (%)
TEMPERATURE °C
EX. 11 COPPER WITH NO COATING
EX. 12 COPPER + 0.10 WT. % TiO2
EX. 13 COPPER + 0.20 WT. % TiO2

2. The composition of claim 1 in which the coating is an oxide of a metal selected from the group consisting of Si, Ti, Ce, Zr, Al, Ba, Sr, La, Mg, Ca, V, Ta and mixtures thereof.

4,594,182

INDIUM TIN OXIDE SOL COMPOSITION

Tadanori Hashimoto; Hiroshi Yoshitake; Hiroyuki Yokoyama, and Akiko Nakazono, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed May 29, 1984, Ser. No. 614,929

Claims priority, application Japan, May 27, 1983, 58-94472; May 27, 1983, 58-94473; May 27, 1983, 58-94474

Int. Cl.⁴ B01J *13/00;* H01B *1/08*

U.S. Cl. 252—518 **7 Claims**

1. An indium tin oxide sol composition for coating on a substrate to form a transparent conductive film comprising about 0.5 to about 30% by weight of indium oxide, tin oxide in an amount of about 0.5 to about 30% by weight, as converted to a basis of tin, based on indium in the indium oxide, in a dispersing medium, which sol composition is obtained by contacting a solution of an indium salt of an inorganic acid containing a tin salt of an inorganic acid with an ion-exchange resin.

4,594,183

PERFUME COMPOSITIONS AND PERFUMED ARTICLES CONTAINING ONE OR MORE TETRAMETHYL-TRI-CYCLOUNDECYL-ALKYL KETONES AS PERFUME BASE

Antonius J. A. Van Der Weerdt, Huizen, Netherlands, assignor to Naarden International N.V., Netherlands

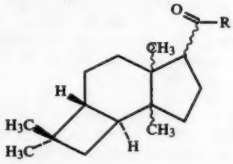
Division of Ser. No. 417,206, Sep. 13, 1982, Pat. No. 4,453,014. This application Feb. 28, 1984, Ser. No. 584,481

Claims priority, application Netherlands, Sep. 16, 1981, 8104273

Int. Cl.⁴ A61K *7/46;* C11B *9/00*

U.S. Cl. 252—522 R **7 Claims**

1. Perfume composition, perfumed material and perfumed article, comprising an effective odorant amount of one or more isomers of 9-alkanoyl-1.4.4.8-tetramethyl-tricyclo[6.3.0.0^{2,5}]undecanes having the formula



(I)

wherein R is methyl, ethyl or n-propyl, with other customary perfumery ingredients materials or articles.

4. Perfume composition, perfumed material and perfumed article comprising an effective odorant amount of the reaction product obtained by radical addition to caryophyllene of a chemical selected from the group consisting of acetaldehyde, propanal and n-butanal; with other customary perfumery ingredients materials, or articles.

4,594,184

CHLORINE BLEACH COMPATIBLE LIQUID DETERGENT COMPOSITIONS

Thomas E. Cook, Cincinnati; John C. Dyer, Fairfield, and Manuel G. Venegas, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 23, 1985, Ser. No. 737,293

Int. Cl.[4] C11D *1/86, 3/28*

U.S. Cl. 252—542 **14 Claims**

1. A heavy-duty liquid composition comprising, by weight:

(a) from about 10% to about 35%, of anionic surfactant on an acid basis;

(b) from 0% to about 15% of ethoxylated nonionic surfactant of the formula $R^1(OC_2H_4)_nOH$, wherein R^1 is a C_{10}–C_{16} alkyl group or a C_8–C_{12} alkyl phenyl group, n averages from about 3 to about 9, and said nonionic surfactant has an HLB of from about 10 to about 13;

(c) from about 0% to about 15% of a cosurfactant selected from the group consisting of:

(i) quaternary ammonium surfactants having the formula:

$$[R^2(OR^3)_y][R^4(OR^3)_y]_2R^5N^+X^-$$

wherein R^2 is an alkyl or alkyl benzyl group having from about 6 to about 16 carbon atoms in the alkyl chain; each R^3 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2CH(CH_3)-$, $-CH_2CH(CH_2OH)-$, $-CH_2CH_2CH_2-$, and mixtures thereof; each R^4 is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 hydroxyalkyl, benzyl, and hydrogen when y is not 0; R^5 is the same as R^4 or is an alkyl chain wherein the total number of carbon atoms of R^2 plus R^5 is from about 8 to about 16; each y averages from 0 to about 10 and the sum of the y values is from 0 to about 15; and X is any compatible anion;

(ii) amine surfactants having the formula:

$$[R^2(OR^3)_y][R^4(OR^3)_y]R^5N$$

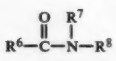
wherein R^2, R^3, R^4, R^5 and y are as defined above;

(iii) amine oxide surfactants having the formula:

$$[R^2(OR^3)_y][R^4(OR^3)_y]R^5N\rightarrow O$$

wherein R^2, R^3, R^4, R^5 and y are as defined above;

(iv) an amide surfactant of the formula:



wherein R^6 is an alkyl, hydroxyalkyl or alkenyl radical containing from about 8 to about 20 carbon atoms, and R^7 and R^8 are each selected from the group consisting of hydrogen, methyl, ethyl, propyl, isopropyl, 2-hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, and wherein said radicals additionally contain up to about 5 ethylene oxide units; and

(v) mixtures thereof;

(d) from 0% to about 30% of detergent builder;

(e) a neutralization system comprising from about 0.5% to about 10% of a bicyclic tertiary amine or imine selected from the group consisting of quinuclidine; 1,8-diazobicyclo [5.4.0] undec-7-ene; hexamethylene tetraamine and mixtures thereof; and

(f) an aqueous solvent system.

4,594,185

ALKOXYLATED PLASTICIZER ALCOHOL ETHER SULFATE SURFACTANTS

Haven S. Kesling, Jr., Drexel Hill, and Hyman D. Gillman, Spring City, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 25, 1984, Ser. No. 624,322

Int. Cl.[4] C11D *1/14;* **C07C** *141/02*

U.S. Cl. 252—551 **14 Claims**

1. A water-soluble, liquid alkoxylated ether sulfate anionic surfactant having the formula:

$$R[OCH_2CH(R')]_mZnSO_3M$$

wherein R is a primary hydrocarbon linear alkyl radical containing of from about 4 to 10 carbon atoms; R' is a member selected from the group consisting of methyl and ethyl; m is an integer of from 7 to 12; Z is an oxyethylene group or a random mixture of oxyethylene groups and oxyalkylene groups present in the radical $[CH_2CH(R')O]$, the molar ratio of oxyethylene to oxyalkylene groups in said mixture being such that the total molar ratio of oxyethylene to oxyalkylene groups in said formula is from about 1:1 to 1:10; n is an integer of from 0 to 4; and M is hydrogen, an alkali metal, an alkaline earth metal; ammonium or a primary, secondary, tertiary or quaternary alkyl ammonium or alkylolammonium ion.

4,594,186

METHOD FOR IMPROVING THE RADIONUCLIDE RETENTION PROPERTIES OF SOLIDIFIED RADIOACTIVE WASTES

Siegmar Kunze, Gernsbach; Günter Lösch, Leimersheim; Theodor Dippel, Eggenstein, all of Fed. Rep. of Germany; Dietrich Laske, Zurich, and Walter Hübner, Baden, both of Switzerland, assignors to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 487,026

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1982, 3215508

Int. Cl.[4] G21F *9/16*

U.S. Cl. 252—628 **11 Claims**

1. Process for solidifying radioactive waste wherein the waste is in solid or aqueous, flowable or liquid form, by mixing the waste with a binder to form a mixture and then leaving the mixture to harden, comprising: forming a mixture of the waste, the binder and an additive which is natural volcanic rock detritus, the detritus having a total content of CaO+MgO up to a maximum of 6.5 percent by weight and less than 50 percent by weight of residue insoluble in mineral acid, said detritus additive being mixed in an amount between 1 percent by weight and 60 percent by weight of the binder employed.

4,594,187

PROCESS FOR PREPARING ANTIBIOTIC L 17054

Paolo Strazzolini, Fiume Veneto; Adriano Malabarba, and Bruno Cavalleri, both of Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Dec. 11, 1984, Ser. No. 680,460

Claims priority, application United Kingdom, Dec. 16, 1983, 8333624

Int. Cl.[4] C07C *103/52;* **C07H** *15/26*

U.S. Cl. 530—332 **9 Claims**

1. A process for preparing an antibiotic substance selected from antibiotic L 17054 and its pharmaceutically acceptable addition salts which, in the non-salt form, is characterized by:

(a) the specific rotation $[\alpha]_D^{20}$ is $-34°$ (c=1%, DMF)

(b) it is freely soluble in water at pH > 8.0, in dimethylformamide, dimethylsulfoxide, propyleneglycol and methylcellosolve; slightly soluble in methanol; almost insoluble in ethyl ether and acetone

(c) an ultraviolet absorption spectrum which has the following absorption maxima:
in 0.1N hydrochloric acid:
λ_{max} 278 nm ($E_{1\ cm}^{1\%} = 60.6$)
in 0.1N sodium hydroxide:
λ_{max} 297 nm ($E_{1\ cm}^{1\%} = 118.8$)
in phosphate buffer pH 7.4:
λ_{max} 277 nm ($E_{1\ cm}^{1\%} = 70.3$)

(d) an infrared absorption spectrum in nujol with the following absorption maxima (cm^{-1}): 3700–2000, 29700–2850 (nujol), 1655, 1610, 1595, 1515, 1490, 1460 (nujol), 1375 (nujol), 1300, 1230, 1145, 1060, 1020, 970, 890, 850, 820, 720 (nujol)

(e) an elemental analysis, after the sample has been previously dried at about 140° C. under inert atmosphere (weight loss = 7.8%), which indicated the following approximate percentage composition (average): carbon 55.46%; hydrogen, 4.50%; nitrogen 7.20%; chlorine 4.67; ashes 0.2%

(f) it has the following R_f values in the TLC systems indicated below:

	Elution system (v/v)	R_f value
(I)	Acetonitrile/water 75:25 (silica gel Merck 60 F_{254})	0.32
(II)	Acetonitrile/5% aqueous sodium sulfate 30:70 (silica gel Merck silanized 60 F_{254}) Visualization: UV-light at 254 nm; 3% ethanolic ninhydrine 1% methanolic fluorescamine;	0.61

(g) a retention time (t_R) of 8.3 minutes when analyzed by HPLC using a 150×4.0 mm Zorbax® ODS (5–6 μm) column (Zorbax is a trademark of the Dupont Co. for an octadecylsilane silica gel matrix), and eluting with a linear gradient from 0% to 50% solution B in solution A in 40 minutes (solution A: 25 mM NaH_2P_4/acetonitrile 9:1, buffered at pH 6.0 with 0.1N NaOH; solution B: 25 mM NaH_2PO_4/acetonitrile 3:7, buffered at pH 6.0 with 0.1N NaOH), with a flow rate of 2 ml/min.; (internal standard: 3,5-dihydroxytoluene t_R 5.60 minutes)

(h) the ^1H NMR spectrum is registered at 270 MHz in DMSO-d_6 at 60°C. and with a sample concentration of 20 mg/ml (internal standard TMS, δ = 0.00 ppm); some of the ^1H NMR data obtained after D_2O exchange and selective decoupling experiments are as follows
(δppm, multiplicity): 1.88, s; 2.85, d; ~3.5, dd; 3–4; 4.20, d; 4.48, d; 4.50, d; 4.62, s; 4.96, ddd; 5.18 d; 5.31, s; 5.35, d; 5.39, s; 5.68, d; 5.71, s; 6.20, d; 6.41, s; 6.51, s; 6.56, s; 6.74, d; 6.77, s; 6.80, s; 6.80, d; 6.98, d; 7.08, s; 7.15, d; 7.21, d; 7.28, d; 7.35, d; 7.50, d; 7.56, d; 7.64, d; 7.73, d; 7.85, s; 8.42, d

(i) a potentiometric titration profile which shows three titration slopes with $pH\frac{1}{2}$ values equal to 5.0 (one equivalent), 7.0 (one equivalent), and 11 (five equivalents) in methylcellosolve/water 4:1 upon titrating a solution of the test compound containing an excess of 0.01N HCl in methylcellosolve/water 4:1 with 0.01N NaOH in the same solvent mixture

(l) an acidic function capable of forming salts

(m) a basic function capable of forming salts

(n) two sugar residues which are α-D-mannose and N-acetyl-β-D-glucosamine

which comprises submitting a crude or essentially pure preparation of the antibiotic teicoplanin, a factor or component thereof or a mixture of said factors or components in any proportion to controlled acid hydrolysis in a strongf concentrated aqueous organic acid at about room temperature.

4,594,188

USE OF DIAMINO KETONES AS ANALGESIC AGENTS

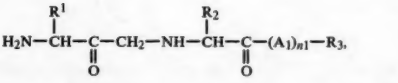
Norma G. Delaney, Princeton, and Eric M. Gordon, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 629,934, Jul. 11, 1984, Pat. No. 4,539,312. This application May 20, 1985, Ser. No. 735,924

Int. Cl.[4] **C07K** *5/06;* **C07C** *149/43, 101/00, 101/02, 109/10, 101/42, 61/08, 147/02, 149/243, 109/106, 101/24, 69/74, 149/20, 101/26, 149/40*

U.S. Cl. 530—332 **11 Claims**

1. A compound having the formula

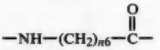


or a pharmaceutically acceptable salt thereof, wherein

R_1 and R_2 are each independently hydrogen, alkyl, carboxyalkyl, halo substituted alkyl, hydroxyalkyl, aminoalkyl, mercaptoalkyl, alkylthioalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, arylalkyl, carbamoylalkyl, guanidinylalkyl, or heteroaryl;

R_3 is hydroxy, alkoxy, (substituted alkyl)oxy, arylalkoxy, (heteroaryl)alkoxy or $—NY_1Y_2$, wherein Y_1 and Y_2 are each independently hydrogen, alkyl, aryl, or arylalkyl, or Y_1 is hydrogen and Y_2 is substituted alkyl or (heteroaryl)alkyl;

A_1 is glycyl, alanyl, leucyl, phenylalanyl, arginyl, sarcosyl, seryl, asparagyl, lysyl, glutamyl, histidyl, tryptophyl, cysteinyl, methionyl, threonyl, tyrosyl, leucyl, valyl, aspartyl, prolyl, norleucyl, norvalyl, or



wherein n_6 is an integer of 2 to 15;

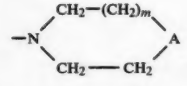
n_1 is 0 or 1; and wherein

the terms "alkyl" and "alkoxy" refer to straight and branched chain groups having 1 to 7 carbon atoms;

the term "halo" substituted alkyl" refer to alkyl groups in which one, or more, hydrogens have been replaced by chloro, bromo, or fluoro groups;

the term "cycloalkyl" refers to cycloalkyl groups having 3, 4, 5, 6, or 7 carbon atoms;

the term "substituted alkyl" refers to alkyl groups substituted with one, or more, hydroxy or $—NY_3Y_4$ groups wherein Y_3 and Y_4 are the same or different and each is hydrogen or alkyl, Y_3 is hydrogen and Y_4 is aryl, or Y_3 and Y_4 together with the nitrogen atom to which they are attached form a heterocyclic group having the formula



and A is CH—Q, oxygen, or N—Q, Q is hydrogen or alkyl and m is 0 or 1;

the term "heteroaryl" refers to 2- or 3-furanyl, 2- or 3-thienyl, 2-, 3- or 4-pyridinyl, 4-imidazolyl and 3-indolyl; and

the term "aryl" refers to phenyl and phenyl substituted with 1, 2 or 3 alkyl, alkoxy, alkylthio, hydroxy, chlorine, bromine, fluorine, amino, alkylamino, dialkylamino, nitro or trifluoromethyl groups.

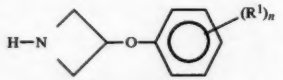
4,594,189

PROCESS FOR PREPARING 3-PHENOXY-1-AZETIDINES AND CARBOXAMIDE DERIVATIVES

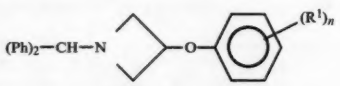
Young S. Lo, Richmond, and Richard P. Mays, Ashland, both of Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Jul. 6, 1983, Ser. No. 511,077
Int. Cl.[4] C07D *705/04*
U.S. Cl. 260—239 A **7 Claims**

1. A process for preparing 3-phenoxyazetidines having the formula:



wherein R^1 is selected from the group consisting of hydrogen, fluoro, loweralkyl, loweralkoxy, trifluoromethyl, acetyl or aminocarbonyl, and n is selected from 1 to 3 inclusive wherein R^1 may be the same or different, which comprises reacting a 1-diphenylmethyl-3-phenoxyazetidine having the formula:



wherein Ph is phenyl or phenyl substituted by a non-interfering group and R^1 and n are as defined above with hydrogen gas with a hydrogenolysis catalyst in a protic solvent together with an azetidine stabilizing tertiary organic base inert hydrogenolysis.

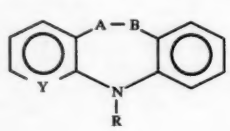
4,594,190

QUATERNARY SALTS OF DIBENZO[1,4]DIAZEPINONES, PYRIDO-[1,4]BENZODIAZEPINONES, PYRIDO[1,5]BENZODIAZEPINONES WITH ANTIULCER, ANTISECRETORY, SPASMOLYTIC AND ANTIMUSARINIC ACTIVITIES

Roberto Giani; Ettore Parini, and Giancarlo Tonon, all of Milan, Italy, assignors to Dompe' Farmaceutici S.p.A., Milan, Italy

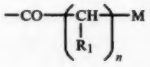
Filed May 9, 1984, Ser. No. 609,102
Claims priority, application Italy, May 17, 1983, 21135 A/83
Int. Cl.[4] C07D *401/04, 401/06;* A61K *31/33*
U.S. Cl. 260—239.3 R **9 Claims**

1. A compound of formula I

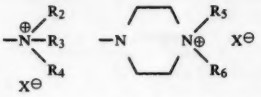


I

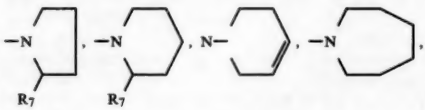
wherein
Y is N or CH,
A is NH,
B is C═O or C═S or vice versa,
R is a group of formula

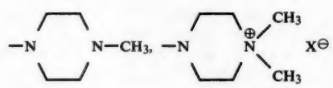


wherein R_1 is hydrogen or C_1–C_4 alkyl and n is 1 or 2, M represents one of the following groups

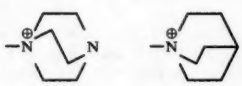


wherein X^- is the anion of an halogenidric acid, R_2, R_3 and R_4, which may be the same or different, represent linear or branched C_1–C_4 alkyl, C_3–C_7 cycloalkyl, pivaloyloxymethyl, benzyl or R_2 has one of said meanings and R_3 and R_4 together form one of the following cyclic groups





wherein
R_7 is hydrogen or methyl and $X^\ominus$ has the above defined meaning, or
R_2, R_3 and R_4, taken together, form one of the following groups:



R_5 and R_6, which can be the same or different, represent methyl, ethyl, benzyl, 3,4-methylenedioxybenzyl or pivaloyloxymethyl.

9. A pharmaceutical composition having antiscretoric, antiulcerogenic, spasmolytic and antimuscarinic activities containing as the principal active ingredient an antisecretoric, antiulcerogenic, spasmolytic and antimuscarinic effective amount of a compound according to claim 1 in admixture with a pharmaceutically acceptable carrier.

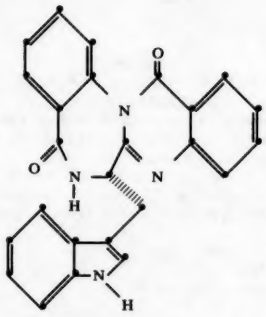
4,594,191

PROCESS FOR PREPARING A BENZODIAZEPINEDIONE DERIVATIVE

Mark G. Bock, Hatfield; Ben E. Evans, Lansdale; Roger M. Freidinger, Hatfield, and Steven M. Pitzenberger, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 22, 1985, Ser. No. 725,885
Int. Cl.[4] C07D *403/14, 403/06*
U.S. Cl. 260—239.3 P **5 Claims**

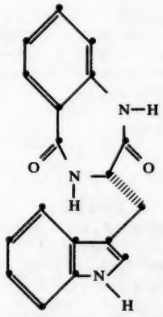
1. A process for preparing a compound of the formula:



X

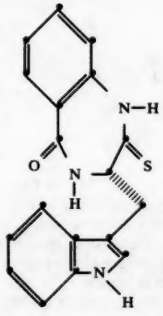
which comprises

(a) treating tryptophan with isatoic anhydride to obtain a compound of the formula:



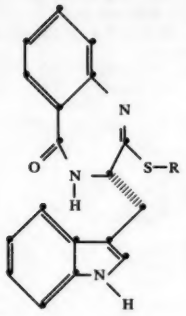
A

(b) treating A with Lawesson's Reagent to obtain a compound of the formula:



B

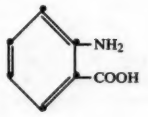
(c) treating B with RI wherein R is lower alkyl to obtain a compound of the formula:



C

and

(d) condensing C with



to obtain X.

4,594,192

2α-FLUOROVITAMIN D_3

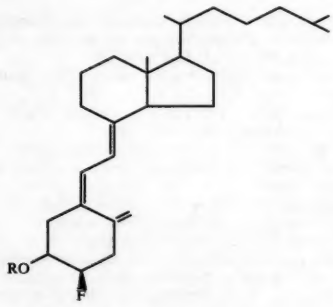
Hector F. DeLuca, Madison, Wis.; Yoko Tanaka, Delmar, N.Y.; Nobuo Ikekawa, and Yoshiro Kobayashi, both of Tokyo, Japan, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 20, 1985, Ser. No. 713,941

Int. Cl.[4] C07J *9/00*

U.S. Cl. 260—397.2 **3 Claims**

1. Compounds having the formula



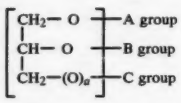
where R is hydrogen or O-acyl.

4,594,193
THIOL BASED LIPIDS AND MEMBRANES MADE THEREFROM

Steven L. Regen, Milwaukee, Wis., assignor to Research Corporation, New York, N.Y.

Filed Sep. 26, 1984, Ser. No. 654,831
Int. Cl.[4] C07F 9/10
U.S. Cl. 260—399 24 Claims

1. A compound of the structure



wherein a is 0 or 1,

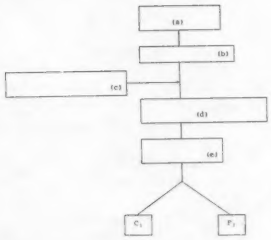
one of said A, B and C groups is a liposome forming head group adaptable to forming vesicles, one or two of the remaining of such A, B and C groups have the structure

wherein Z is SH or SSR_5, R_4 is a hydrocarbon radical containing about 10 to 25 carbon atoms, R_5 is a C_1 to C_{25} hydrocarbon radical and the remainder, if any, of such A, B and C groups is an inert group.

4,594,194
FAT FRACTIONATION

Albrecht Dieffenbacher, Saint-Légier, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Filed Sep. 7, 1984, Ser. No. 648,180
Claims priority, application Switzerland, Oct. 7, 1983, 5467/83
Int. Cl.[4] C09F 5/10
U.S. Cl. 260—428 14 Claims



1. A process for the dry fractionation of a pre-refined vegetable fat capable of crystallizing in several forms at temperatures between 20° and 35° C. comprising:

(a) heating the pre-refined fat to convert it entirely into liquid form,

(b) cooling the liquid of step (a) to a temperature 3° to 10° C. above its solidification temperature,

(c) seeding the cooled liquid with storage-stabilized β crystals obtained from said fat or from cocoa butter to obtain a suspension,

(d) progressively cooling the suspension of step (c) at a rate of 0.5° to 1.5° C. per hour to a fractionation temperature in the range from 20° to 35° C., and then

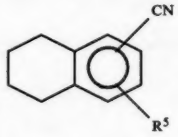
(e) filtering the suspension of step (d) under a pressure of at least 20 kg/cm^2 at the fractionation temperature and collecting a concrete fraction (C_1) having an iodine value of at most 50 and a fluid fraction (F_1) having a higher iodine value than the concrete fraction (C_1), the difference between the iodine value of the fraction (C_1) and that of the fraction (F_1) being at least 10.

4,594,195
5,6,3,7,8-TETRAHYDRO-NAPHONITRILE INTERMEDIATES

Peter M. Newsome, Cheam; Noel A. Mullan, Cranleigh, and John P. Marshall, Lacey Green, all of England, assignors to Beecham Group p.l.c., England

Division of Ser. No. 504,257, Jun. 14, 1983, Pat. No. 4,539,319. This application Dec. 21, 1984, Ser. No. 684,630
Claims priority, application United Kingdom, Jun. 16, 1982, 8217452
Int. Cl.[4] C07C 121/75
U.S. Cl. 558—412 6 Claims

1. A compound of formula (II)



(II)

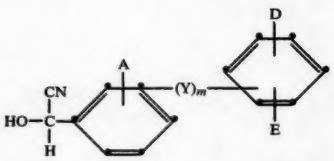
wherein R^5 is hydroxy, base stable protected hydroxy, alkoxy, aryloxy, aralkoxy, heteroaryloxy or heteroaryl C_{1-6} alkyloxy wherein the heteroaryl moiety is a mono- or fused bicyclic aromatic group containing up to 4 heteroatoms selected from oxygen, sulphur and nitrogen.

4,594,196
PREPARATION OF OPTICALLY ACTIVE ALPHA-HYDROXYNITRILES

Donald W. Stoutamire, Modesto, Calif., and Walter Dong, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 443,763, Nov. 22, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,548
Int. Cl.[4] C07C 121/66
U.S. Cl. 558—351 16 Claims

1. A process for the preparation of an optically-active alpha-hydroxynitrile of formula I



I

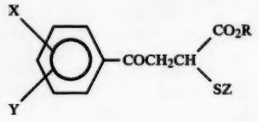
wherein m is 0 or 1; Y is 0, CH_2, or C(0); A, D and E each independently is a hydrogen atom, a halogen atom having an atomic number of from 9 to 35, inclusive, or an alkyl or alkoxy group containing 1 to 6 carbon atoms, each optionally substituted by one or more halogen atoms having an atomic number of from 9 to 35, inclusive, or a mixture enriched therein which comprises treating the corresponding aldehyde with a source of hydrogen cyanide in the presence of a substantially water-immiscible, aprotic solvent and a cyclo(D-phenylalanyl-D-histidine) as a catalyst.

4,594,197
3-BENZOYL-2-MERCAPTOPROPIONIC ACID DERIVATIVES

Kazuyuki Tomisawa, Saitama; Kazuya Kameo; Toru Matsunaga, both of Ageo; Shiuji Saito, Niiza; Yoshimoto Nakashima, Ageo, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1984, Ser. No. 646,230
Claims priority, application Japan, Sep. 3, 1983, 58-162446
Int. Cl.[4] C07C *149/40, 157/09, 153/023*
U.S. Cl. 558—255 **9 Claims**

1. 3-benzoyl-2-mercaptopropionic acid derivatives represented by the formula:



wherein

X represents a hydrogen atom, a halogen atom, hydroxy group, a lower alkyl group or a lower alkoxy group,

Y represents a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group,

Z represents a hydrogen atom or a lower alkanoyl group, a benzoyl group or a toluoyl group, and

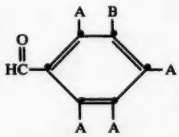
R represents a hydrogen atom or a lower alkyl group.

4,594,198
CYANOHYDRINATION OF AN AROMATIC ALDEHYDE

Walter Dong, and Walter L. Petty, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

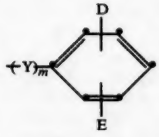
Division of Ser. No. 535,500, Sep. 26, 1983, Pat. No. 4,554,102. This application Jan. 14, 1985, Ser. No. 691,296
Int. Cl.[4] C07C *121/75*
U.S. Cl. 558—351 **9 Claims**

1. A method for the cyanohydrination of an aldehyde with high enantiomeric selectivity wherein an aldehyde of the formula IV



IV

wherein each A is independently a hydrogen atom, a halogen atom having an atomic number of from 9 to 35, inclusive, or an alkyl, alkenyl or alkoxy group containing 1 to 6 carbon atoms, each optionally substituted by one or more halogen atoms having an atomic number of from 9 to 35, inclusive; B is a group



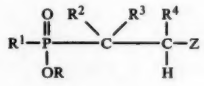
in which Y is 0; CH_2; C(O); m is 0 or 1 and D and E each independently is a hydrogen atom, a halogen atom having an atomic number of from 9 to 35, inclusive, or an alkyl, alkenyl or alkoxy group containing 1 to 6 carbon atoms, each optionally substituted by one or more halogen atoms having an atomic number of from 9 to 35, inclusive, is cyanohydrinated in the presence of a cyclo(D-phenylalanyl-D-histidine)dipeptide catalyst having 45% or more of a non-crystalline or amorphous component of the dipeptide.

4,594,199
METHOD FOR MAKING PHOSPHINIC ACID INTERMEDIATES

John K. Thottathil, Trenton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 533,486, Sep. 19, 1983, abandoned. This application Jan. 22, 1985, Ser. No. 693,419
Int. Cl.[4] C07F *9/32, 9/65*
U.S. Cl. 260—502.4 R **17 Claims**

1. A method for preparing a phosphinic acid intermediate of the structure



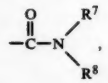
wherein R is H or lower alkyl;

R^1 is lower alkyl, aryl, arylalkyl, cycloalkyl, or cycloalkylalkyl;

R^2, R^3 and R^4 are the same or different and each is independently H, lower alkyl or aryl;

Z is $—CO_2R^5$ (wherein R^5 is H or lower alkyl),

(wherein R^6 is H, lower alkyl, aryl or arylalkyl), —CN, or

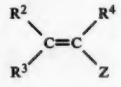


wherein R^7 and R^8 are the same or different and are selected from the group consisting of H, lower alkyl, aryl, aryl-lower alkyl, cycloalkyl or cycloalkylalkyl and at least one of R^7 and R^8 is other than H, or R^7 and R^8 can be taken together with N to form a 5-, 6- or 7-membered heterocyclic ring

which may or may not include a $COOR^5$ substituent, which 5- or 6-membered N-containing ring may or may not be fused to an aryl ring, and

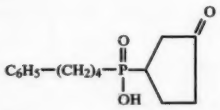
which comprises reacting a phosphonous acid or ester thereof of the structure

wherein R and R^1 are as defined above with a conjugated compound of the structure

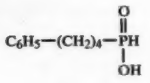


wherein R^2, R^3, R^4 and Z are as defined above, employing a molar ratio of phosphonous acid or ester thereof to the conjugated compound of within the range of from about 0.5:1 to about 10:1, in the presence of a silylating agent employing a molar ratio of phosphonous acid or ester to silylating agent of within the range of from about 0.06:1 to about 2:1 and in the presence of an inert organic solvent to form the phosphinic acid intermediate and separating the phosphinic acid intermediate from the reaction mixture.

17. A method for preparing a phosphinic acid intermediate of the structure



which comprises reading a phosphonous acid or ester thereof of the structure

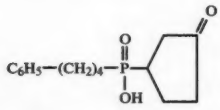


with a compound of the structure

in the presence of a silylating agent of the structure

$(CH_3)_3SiCl$

and an inert organic solvent to form the phosphonic acid intermediate of the structure



and separating said intermediate from the reaction mixture.

4,594,200

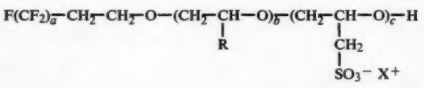
COMPOSITIONS FOR INCREASING HYDROCARBON PRODUCTION FROM SUBTERRANEAN FORMATIONS

Glenn S. Penny, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 15, 1984, Ser. No. 671,546
Int. Cl.[4] E21B *43/22*; C07C *143/08*
U.S. Cl. 260—512 R 14 Claims

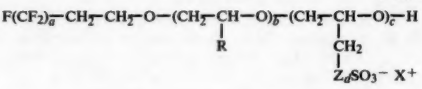
1. A composition of matter comprising an anionic perflurosubstituted compound having a representative formula selected from the group consisting of:

Formula I



and

Formula II



wherein a is a whole number or fraction thereof in the range of from about 4 to about 18;

wherein b is a whole number or fraction thereof in the range of from about 0 to about 30;

wherein c is a whole number or fraction thereof in the range of from about 1 to about 3;

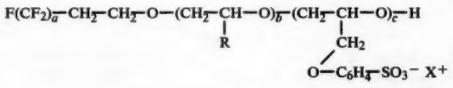
wherein d is independently a whole number or fraction thereof in the range of from about 0 to about 1 and the sum of the average values of d are less than or equal to c;

R is independently selected from the group consisting of hydrogen and a methyl group whereby mixtures containing both groups may result; and

X^+ is an exchangeable cation; and

Z is a nucleophile containing radical species containing at least one member selected from the group consisting of oxygen and nitrogen wherein the nitrogen is in the form of NR^1 wherein R^1 is independently selected from the group consisting of hydrogen and methyl radicals.

6. A composition of matter represented by the formula:



wherein a is a whole number or fraction thereof in the range of from about 6 to about 12;

wherein b is a whole number or fraction thereof in the range of from about 10 to about 20;

wherein c is a whole number or fraction thereof in the range of from about 1 to about 2;

R is independently selected from hydrogen and a methyl radical; and

X^+ is a cation selected from the group consisting of sodium, potassium and ammonium ions.

4,594,201

MULTI-FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Oliver V. Phillips, 10405 W. 32nd, Wheatridge, Colo. 80033, and William R. Phillips, Lakewood, Colo., assignors to Oliver V. Phillips, Wheat Ridge, Colo.

Filed Apr. 16, 1984, Ser. No. 600,673
Int. Cl.[4] F02M *13/06*
U.S. Cl. 261—18 B 10 Claims

1. A multi-fuel system for an internal combustion engine including,

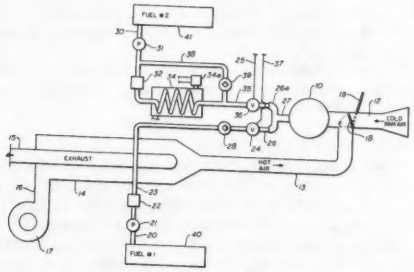
a carburetor having an air inlet and a fuel inlet and means for mixing said air and liquid fuel to form a combustible mixture which is conducted to the engine to operate the same;

a first liquid fuel supply assembly having means for regulating the pressure of said first fuel which is to be supplied to the fuel inlet of said carburetor;

a second liquid fuel supply assembly having means for regulating the pressure of said second fuel which is to be supplied to the fuel inlet of said carburetor;

means for selectively directing either the first or second liquid fuel to the carburetor to operate the engine on such selected fuel; means in each fuel supply assembly for selectively adjusting the regulated pressure of each fuel

delivered to the fuel inlet of the carburetor, said pressure being set in accordance with the fuel being used to assure



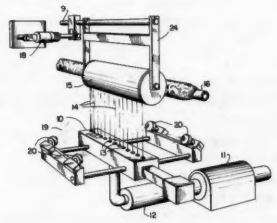
that the required fuel/air ratio of the combustible mixture is supplied to the engine.

4,594,202

METHOD OF MAKING CYLINDRICAL FIBROUS FILTER STRUCTURES

David B. Pall, Roslyn Estates; Colin F. Harwood, Glen Cove; Arthur Bradley, Floral Park, and Timothy R. Brennan, Old Westbury, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Jan. 6, 1984, Ser. No. 568,824
Int. Cl.⁴ B01D *29/00*
U.S. Cl. 264—8 **13 Claims**



1. A method of manufacturing a cylindrical fibrous structure comprising a fibrous mass of nonwoven, synthetic, polymeric microfibers, said microfibers substantially free of fiber-to-fiber bonding and secured to each other by mechanical entanglement or intertwining, comprising the steps of:

(a) extruding synthetic, polymeric material from a fiberizing die and attenuating said extruded polymeric material to form said synthetic, polymeric microfibers by the application of one or more gas streams directed toward a rotating, reciprocating mandrel and a rotating forming roll in operative relationship with said mandrel;

(b) cooling said synthetic, polymeric microfibers prior to their collection on said mandrel to a temperature below that at which said microfibers bond or fuse to each other, thereby substantially eliminating fiber-to-fiber bonding; and

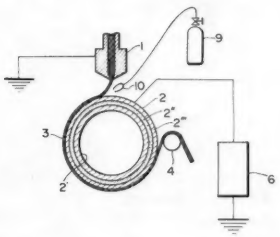
(c) collecting said cooled microfibers on said mandrel as a nonwoven, synthetic fibrous mass while applying a force to the exterior surface of the collected microfibers by said forming roll; wherein the process variables are controlled to form said cylindrical fibrous structure with said fibrous mass having a substantially constant voids volume and varying fiber diameter over at least a substantial portion thereof as measured in the radial direction to achieve a varying pore size over said portion.

4,594,203

METHOD FOR PRODUCING A THERMOPLASTIC POLYMERIC SHEET

Satoru Hagiwara; Ichiro Ishizuka, both of Otsu, and Kazuo Okabe, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 13, 1984, Ser. No. 588,963
Claims priority, application Japan, Mar. 16, 1983, 58-42323; Apr. 7, 1983, 58-61195
Int. Cl.⁴ B29C *71/04*
U.S. Cl. 264—22 **34 Claims**



1. A method for producing a thermoplastic polymeric sheet comprising:

extruding a molten thermoplastic polymer in the form of a sheet from an extrusion die onto a moving quenching member;

maintaining the contact area of the molten thermoplastic polymer in the form of a sheet with the moving quenching member in a gaseous atmosphere more insulating than that of air; and

electrically adhering the molten thermoplastic polymer in the form of a sheet to the quenching member and solidifying the sheet with an electric potential difference applied between the extrusion die and the moving quenching member.

4,594,204

PROCESS FOR ANNEALING THERMOPLASTICALLY-SHAPED PLASTICS PARTS

Klaus Heidenreich, Leverkusen; Hans-Werner Depcik, Duesseldorf, and Hans Radojewski, Leverdusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,135
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336244
Int. Cl.⁴ B29C *35/08*
U.S. Cl. 264—25 **3 Claims**

1. A process for annealing thermoplastically-shaped plastics parts for reducing the internal stresses, by treating the plastics parts after shaping with heat wherein the heat is transmitted to the plastics parts for 20–240 seconds by infra-red radiation of from 1200 nm to 5000 nm to produce a temperature of from 10 to 20% below the Vicat-softening temperature of the plastics parts.

4,594,205

METHOD FOR FORMING CONCRETE FLUSH FLOORS HAVING INTEGRAL TROUGHS

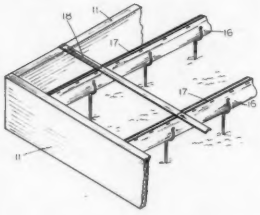
Max A. Wunderlich, Jr., and Stephen E. Kneifel, both of Columbus, Nebr., assignors to Wunderlich Construction Inc., Columbus, Nebr.

Filed Dec. 7, 1984, Ser. No. 679,427
Int. Cl.⁴ E04B *1/16*; B28B *7/16*
U.S. Cl. 264—31 **5 Claims**

1. A method of forming a concrete flush floor having at least

one trough integrally formed therein, the method comprising the steps of:

(a) substantially colinearly disposing in an area where said floor is to be formed a plurality of high chair units for each said trough, each high chair unit having a support member and a mold fitting member operably supported by said support member;



(b) disposing a substantially resilient trough mold through each said mold fitting member;

(c) disposing concrete about said trough mold in said area to form said floor;

(d) allowing said concrete to harden; and

(e) removing said trough molds from said concrete by sliding said trough molds out of said integrally formed troughs.

4,594,206

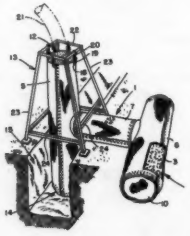
CONCRETE STRUCTURES FOR USE IN SHORE PROTECTION AND/OR WAVE CONTROL AND METHOD OF MAKING SAME

Harry D. Grafton, 869 Wagar Rd., Rocky River, Ohio 44116

Continuation-in-part of Ser. No. 534,193, Sep. 21, 1983, abandoned. This application Apr. 5, 1984, Ser. No. 596,851

Int. Cl.[4] E02B *3/14*

U.S. Cl. 264—35 **20 Claims**



1. A method of making a concrete structure for use in shore protection or wave control utilizing a fabric container having an opening in one end thereof comprising the steps of suspending such one end of such fabric container having such opening therein around the outer periphery of such one end above the ground from a support frame above the fabric container, and filling such container with concrete through such opening therein while such one end is thus suspended around such outer periphery from such support frame, such one end of such container containing such opening being suspended from such support frame by elastic cords connected to the outer periphery of such one end while the oppopsite end of such container is supported on the ground.

4,594,207

METHOD FOR THE PRODUCTION OF POROUS BODIES WITH ADJUSTABLE TOTAL PORE VOLUME, ADJUSTABLE PORE SIZE AND ADJUSTABLE PORE WALLS

Christoph Josefiak, Kleinwallstadt, and Friedbert Wechs, Wörth, both of Fed. Rep. of Germany, assignors to Akzo NV, Bm Arnhem, Netherlands

Filed Feb. 10, 1983, Ser. No. 465,560

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1982, 3205289

Int. Cl.[4] C08J *9/26*

U.S. Cl. 264—41 **27 Claims**

1. Method for the production of porous bodies, shaped and non-shaped, with adjustable total pore volume, adjustable pore size and adjustable pore walls, comprising dissolving a polymer through heating above the upper critical temperature T_c in a mixture of two compounds A and B, liquid and miscible at the dissolving temperature, the pore volume, pore size and pore walls being adjustable by varying the relative proportions of compounds A and B in the mixture, the employed mixture of polymer, compound A and compound B displaying in liquid aggregate state a miscibility gap, the compound A being a solvent for the polymer and the compound B acting to raise the phase separation temperature of a solution composed of a polymer and the compound A and bringing it to dissociation and setting by means of cooling.

4,594,208

POLYMER FOAM, THERMOFORMED SHAPES THEREOF AND METHODS OF FORMING SAME

Charles M. Krutchen, Pittsford, and Wen-Pao Wu, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 560,641, Dec. 12, 1983. This application Jun. 18, 1984, Ser. No. 622,023

Int. Cl.[4] B29H *7/20*; B29D *27/00*

U.S. Cl. 264—53 **7 Claims**

1. The process of preparing a low density polymer foam structure, said polymer being a solvent imbibable polyetherimide, comprising:

(a) providing said polymer in particle form imbibed with a solvent member selected from the group consisting of methylene chloride, chloroform, 1,1,2-trichloroethane and mixtures thereof;

(b) homogeneously melt blending said particles and solvent in an extrusion system under pressure; and

(c) extruding said melt blend into a lower pressure atmosphere to cause said solvent to vaporize yielding a foam structure said foam structure having a density of less than about 20 lbs/ft^3.

4,594,209

PROCESS FOR THE PREPARATION OF VOLTAGE NON-LINEARITY TYPE RESISTORS

Keiichi Minegishi; Tokuji Akiba; Keiichi Katayama, and Hiroshi Machida, all of Saitama, Japan, assignors to Chichibu Cement Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,095

Claims priority, application Japan, Mar. 22, 1983, 58-45913

Int. Cl.[4] C04B *33/02*

U.S. Cl. 264—66 **12 Claims**

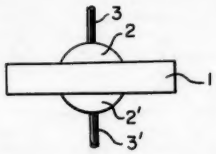
1. A process for the preparation of voltage non-linearity type resistors comprising:

(a) pre-sintering a ZnO/Fe_2O_3 composition comprising X mole % of ZnO and (100−X) mole % of Fe_2O_3, wherein $40 \leqq X \leqq 60$, to produce a pre-sintered body;

(b) powdering said pre-sintered body to produce sintered powders;

(c) adding to said sintered powders at least one member selected from the group consisting of V_2O_5, Bi_2O_3, MgO,

Al_2O_3, MoO_3, Sb_2O_3, SiO_2, NiO, SrO_2 and PbO in an amount of from about 0.01 to 40% by weight; and



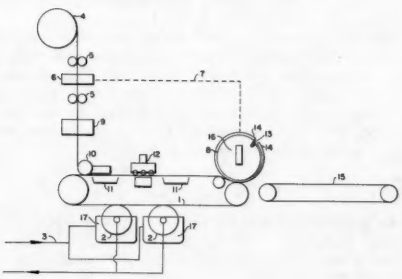
(d) compacting and sintering the resulting formulation to obtain a voltage non-linearity type resistor body.

4,594,210

PROCESS FOR MANUFACTURING CEMENT PLATES REINFORCED WITH FIBRILLATED POLYMERIC FILMS

Andrea Vittone, Milan; Giuseppe Chiappini, Albiano Magra, and Massimo Di Paola, Rapallo, all of Italy, assignors to Moplefan S.p.A., Milan, Italy

Filed Jan. 18, 1984, Ser. No. 571,718
Claims priority, application Italy, Jan. 18, 1983, 19149 A/83
Int. Cl.[4] B28B *23/00*
U.S. Cl. 264—70 **4 Claims**



1. A process for continuously manufacturing plates containing an incorporated reinforcement including a fibrillated polymeric film comprising an open net, which comprises the following steps:

(a) unwinding at least one net comprising a plurality of fibrillated polymeric film layers, in an open form, from at least one continuous reel,

(b) cutting said net into pieces having a length approximately equal to a circumference of a forming roll for forming a said plate to be manufactured,

(c) impregnating the net pieces with a cement mix,

(d) depositing the net pieces onto a conveyor belt on which a cement mix layer has been previously deposited, said cement mix layer containing from 15 to 100 parts by weight of water referred to 100 parts by weight of solids and having a thickness at least equal to that of said net,

(e) subjecting the net after it has come into contact with the cement mix layer to percussion and vertical vibration actions,

(f) applying a vacuum to said net contacting said cement layer to remove excess water and to increase a degree of compactness between said net and cement of said cement layer,

(g) winding a net-cement panel resulting from step (f) onto a said forming roll having a circumference approximately equal to a length of a said net piece, and simultaneously applying pressure to said net-cement panel during said winding step, so that ends of said net piece are disposed adjacent to a notch located at a periphery of said forming roll,

(h) cutting a said plate to be manufactured at the notch adjacent to which the ends of the net pieces are arranged without stopping rotation of said forming roll, and

(i) compressing the plate cut in step (h).

4,594,211

PREPARING POLYOLEFINE BASED OPAQUE FILM

Dietrich Mohnhaupt, La Fontaine, CH-1261 Bassins, Switzerland

Filed Nov. 5, 1984, Ser. No. 668,035
Int. Cl.[4] B29B *9/06, 9/16*
U.S. Cl. 264—141 **8 Claims**

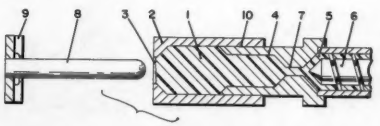
1. A method for preparing a polyolefine based opaque film sheet or film web, having a thickness in the range of from about 15 to about 200 micrometers, comprising an intimate blend of a olefine homopolymer, at least one pigment filler, and an ethylene-vinyl acetate copolymer, characterized by the fact that first a masterbatch is prepared in throughly blending polyolefine, copolymer and pigment, then granulating it by extruding the blend and cutting the extruded string into granules, mixing the granules with further polyolefine, and film extruding the mixture of polyolefine and masterbatch, wherein the amount of filler and copolymer is effective to produce an opaque sheet or film web without impairing the physical and mechanical properties of the pigmented film when compared to the nonpigmented film.

4,594,212

METHOD FOR THE MANUFACTURE OF TUBULAR PREFORMS OF PLASTICS

Johannes Mehnert, Ernstrasse 11, 5205 St. Augustin 3, Menden, and Alfred Effenberger, Finkenstr. 4, 7024 Filderstadt, both of Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,514
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225567
Int. Cl.[4] B29C *45/00, 47/00, 41/02*
U.S. Cl. 264—163 **2 Claims**



1. Method of manufacturing tubular preforms of plastics, comprising the steps of:

(a) filling an adjustable-volume plastics chamber through a constricted central feeding passage with molten plastic from a separate screw chamber,

(b) inserting a blow mandrel into the plastics chamber while expanding the volume of said chamber in proportion to the volume of mandrel inserted,

(c) withdrawing the mandrel along with surrounding plastic to create a preform, while adjusting the volume of the plastics chamber in a preselected sequence of changes whereby a corresponding pattern of thickness is formed in the resulting preform, and

(d) disrupting the preform at the solid strand which is formed on complete emergence of the mandrel from the adjustable-volume plastics chamber.

4,594,213

REDUCTION ELIMINATION OF BUBBLE FORMATION WHEN EXTRUDING GRANULAR POLYOLEFINS

George E. Ealer, Whitehouse Station, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 25, 1984, Ser. No. 654,217
Int. Cl.[4] D01F *1/02*
U.S. Cl. 264—211 15 Claims

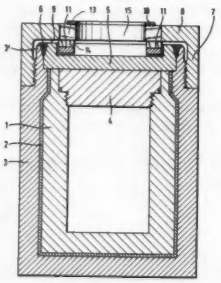
1. A method for reducing lensing in films fabricated from a granular linear narrow molecular weight distribution ethylene hydrocarbon copolymer containing inorganic or mixtures of inorganic and organic antiblock agents and other additives under conditions which would otherwise produce lensing in said films, which comprises, forming a film forming composition which includes a granular linear low density ethylene hydrocarbon copolymer resin, and from about 0.02–20% silica alumina ceramic microspheres having an average particle size of a range of mean diameters of 2–8 microns by volume and having a particle size distribution by volume such that about 90% pass 13 microns and no more than 8% pass 1 micron, extruding said film composition through a film die, and thereafter discharging said composition from said die to form a film of said extruded composition.

4,594,214

CONTAINER FOR STORING RADIOACTIVE MATERIALS

Franz-Wolfgang Popp, Wedemark, and Reinhold Velten, Solms, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,714
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1983, 3325119
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—272 10 Claims



1. A container for storing radioactive material, the container comprising:

a vessel having a base and a wall extending upwardly from said base, said wall terminating in an upper end portion defining the opening of the vessel through which the radioactive material to be stored therein is passed;

a closing cover mounted on said upper end portion for closing off said opening;

sealing means disposed at the outer periphery of said cover for sealing the same with respect to said upper end portion of said vessel;

an annular body attached to said vessel at a location beneath said upper end portion and projecting upwardly in surrounding relationship to said upper end portion thereby defining an annular gap therewith so as to cause said sealing means to be separated from said annular body by said gap, said annular body extending upwardly beyond said upper end portion and then projecting inwardly to define flange means overlapping and spaced from said sealing means for absorbing inadvertent external blows acting upon said container; and,

attachment means for rigidly attaching said annular body to the outer surface of said wall beneath said upper end portion for transmitting said external blows from said annular body directly to said wall at a location thereon beneath said sealing means whereby said blows bypass said sealing means so as to protect said sealing means therefrom.

8. A container for storing radioactive material, the container comprising:

a multilayered vessel having a base and a wall extending upwardly from said base, said wall terminating in an upper end portion defining the opening of the vessel through which the radioactive material to be stored therein is passed;

a closing cover mounted on said upper end portion for closing off said opening and said vessel from the ambient;

a weld seam at the outer periphery of said cover for sealing the same with respect to said vessel;

an L-shaped annular body having one leg mounted to said outer layer of said multi-layered vessel at a location beneath said upper end portion and projecting upwardly in surrounding relationship to said end portion thereby defining an annular gap therewith so as to cause said weld seam to be separated from said annular body by said gap, said annular body extending upwardly beyond said upper end portion whereat the other leg of said L-shaped annular body extends inwardly to define a flange overlapping and spaced from said weld seam for absorbing inadvertent external blows acting upon said container; and,

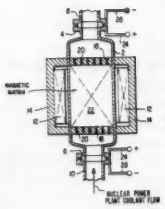
attaching means formed at the interface of said one leg and said outer layer for rigidly attaching said annular body to the outer layer of said wall beneath said upper end portion for transmitting said external blows from said annular body directly to said wall at a location thereon beneath said weld seam whereby said blows bypass said weld seam so as to protect the same therefrom.

4,594,215

AUGMENTED HIGH GRADIENT MAGNETIC FILTER

Armand J. Panson, Aspinwall, and Michael Troy, Leechburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 4, 1983, Ser. No. 549,124
Int. Cl.[4] B01D *17/06*
U.S. Cl. 376—315 8 Claims



1. A method for collecting and trapping magnetic and nonmagnetic particles suspended in a liquid stream flowing in a pipeline in a nuclear power plant comprising: connecting a high gradient magnetic filter into a nuclear power plant coolant system pipeline through which a liquid stream containing undesired suspended magnetic and inorganic nonmagnetic solid particles is flowing so that the filter is electrically insulated from the pipeline; energizing the filter to create a high gradient magnetic field on the suspended particles flowing through the filter; and applying a potential to the magnetic filter so as to polarize the filter relative to the pipeline with a polarity opposite that of the charge on the suspended particles

in the stream to create an electrical field in the filter, whereby larger magnetic particles will be trapped by the filter as a result of the magnetic effect while smaller magnetic particles and inorganic nonmagnetic particles will be trapped by the filter due to electrophoretic deposition.

2. In combination with a nuclear power plant having a coolant system, including at least one pipeline, through which flows a liquid coolant stream, a filter arrangement for removing magnetic and small inorganic nonmagnetic solid particles suspended in said liquid coolant stream comprising in combination:

a high gradient magnetic filter including a nonmagnetic metal pressure vessel of generally cylindrical shape having an opening at each of its ends, and means for producing a magnetic field with high gradients within said vessel to trap magnetic particles in said vessel including a solenoid and an associated yoke concentric with the outer surface of said vessel, first and second perforated magnetic pole pieces for said yoke disposed within said pressure vessel, and a matrix of magnetic material filling the space between said pole pieces;

means for mechanically connecting each open end of said pressure vessel to a respective length of pipeline of said coolant system in an electically insulating manner; and

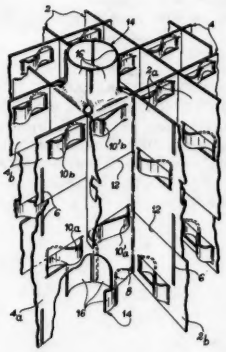
means for applying an electrical potential to at least said pressure vessel and said matrix to polarize same relative to the pipeline with a polarity opposite that of the charge on the particles suspended in a liquid stream flowing through said filter to trap small magnetic and inorganic nonmagnetic particles in said vessel.

4,594,216

SPACING GRID FOR A NUCLEAR REACTOR FUEL ELEMENT

Claude Feutrel, Vauhallan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 28, 1982, Ser. No. 425,966
Claims priority, application France, Oct. 16, 1981, 81 19483
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—442 **8 Claims**



1. In a nuclear reactor fuel assembly having a plurality of fuel elements, a spacing grid for laterally spacing said fuel elements comprising:

no more than two types of sheets including

a first type of sheets, said first type of sheets having a rectangular shape and having a first longitudinal side and a second longitudinal side, and two lateral sides, said lateral sides having a first sheet height as measured between said longitudinal sides, said first longitudinal side and said second longitudinal side of said sheets being formed with a plurality of slots spaced with a first regular interval and extending perpendicular to said longitudinal sides, the slots in said first longitudinal side being aligned with the slots in said second longitudinal side, the slots in said first longitudinal side being formed in a first rectangular area having a height equal to a quarter of the first sheet height, the slots in said second longitudinal side being formed in a second rectangular area having a height equal to a quarter of the first sheet height, each of said slots having a height equal to a quarter of the first sheet height, and

a second type of sheets, said second type of sheets having a rectangular shape, and having a first longitudinal side edge and a second longitudinal side edge and two lateral side edges, said lateral side edges having a second sheet height as measured between said longitudinal side edges, said first longitudinal side edge of said second type sheets being formed with a plurality of second slots perpendicular to said longitudinal side edges and spaced with a second regular interval, said first and second regular intervals being equal, the second slots in said first longitudinal side edges of said second type of sheets being formed in a third rectangular area having a height equal to a half of the second sheet height, each slot having a height equal to a half of the second sheet height,

the first sheet height being double the second sheet height, the grid being comprised solely of a first group and a second group of partitions, parallel in each group and perpendicular from one group to the other, any partition in each of said first and second groups being comprised of both said first and second types of sheets, a first type of sheet being located above and contiguous to a second type of sheet in said first group, a second type of sheet being located above and contiguous to a first type of sheets in said second group, all of said first type of sheets of said first group being contiguous to said second type of sheets of said second group, all of said second type of sheets of said second group being contiguous to said first type of sheets of said first group, the slots in said first side of said second types of sheets of said first group being engaged in the slots in said first side of said first type of sheets of said second group, the slots in said second side of said first type of sheets of said second group being engaged in the slots in said second side of said first type of sheets of said first group, the slots in said first side of said first type of sheets of said first group being engaged in the slots in said first side of said second type of sheets of said second group in order to interengage said sheets in an orthogonal manner to define open-ended cavities having a square cross-section which are bounded by sheets at all locations other than the ends, each cavity being traversed by a fuel element, said first and second types of sheets of said first group and said first and second types of sheets of said second group further including bridges, formed to have an S-shape to define apices for forming fuel element support points in each cavity, one of the apices of each S-shaped bridge being located in one cavity and the other apex in an adjacent cavity, the fuel elements bearing against the apices of these bridges, said bridges being located entirely outside said first and second rectangular areas of said first type of sheets, and entirely outside said third rectangular areas of said second type of sheets.

4,594,217

DIRECT POWDER ROLLING OF DISPERSION STRENGTHENED METALS OR METAL ALLOYS

Prasanna K. Samal, Lyndhurst, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Mar. 7, 1985, Ser. No. 709,102
Int. Cl.[4] B22F *5/00*
U.S. Cl. 419—3 **4 Claims**

1. A process for making a strip comprising dispersion strengthened metal or dispersion strengthened metal alloy said dispersion strengthened metal or dispersion strengthened metal alloy containing from about 0.1 to about 0.5% by weight of a refractory metal oxide calculated as the metal dispersed throughout the metal or metal alloy having a density which is

at or near theoretical density and which comprises rolling directly from said metal or metal alloy as a powder having a particle size in the range of −80 to +400 mesh (Tyler Sieve Size) to a green strip with a density of from about 90% to 95% of theoretical density, sintering the green strip in an inert atmosphere at a temperature and for a period of time sufficient to cause the particles to adhere and form a solid body, reducing the thickness of the body by rolling, and resintering the rolled body in an inert atmosphere.

4,594,218

METHOD OF PRODUCING MULTIFILAMENT LENGTHS OF SUPERCONDUCTOR FROM TERNARY CHALCOGENIDES OF MOLYBDENUM

Patrick Dubots, Neauphle le Chateau, and Jean-Claude Renard, Chilly Maxarin, both of France, assignors to Alsthom-Atlantique, S.A., Paris, France

PCT No. PCT/FR84/00234, § 371 Date Jun. 6, 1985, § 102(e) Date Jun. 6, 1985, PCT Pub. No. WO85/01837, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 18, 1984, Ser. No. 744,490

Int. Cl.⁴ B22F *3/00*

U.S. Cl. 419—4 **5 Claims**

1. A method of making lengths of superconductor from ternary chalcogenide of molybdenum wherein the method comprises:

mixing a powder of a chalcogenide of molybdenum having superconducting properties with a powder of smaller granulometry and chosen from the group consisting of the components of the particular ternary chalcogenide of molybdenum being used, aluminum, silver, gallium, rhenium and titanium;

sheathing the mixture of powder obtained by means of a metal wall for protecting the ternary chalcogenide of molybdenum from copper pollution, the said metal wall being made from one of the group of metals consisting of molybdenum, niobium, tantalum, titanium and vanadium;

drawing and cold working the sheathed mixture of powder by conventional cable-making techniques to form a superconducting length; and

heating said superconducting length to a temperature of about 800° C. for at least twenty hours.

4,594,219

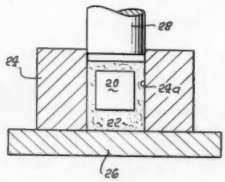
POWDER METAL CONSOLIDATION OF MULTIPLE PREFORMS

Alfred F. Hostatter, Dana Point; Wayne P. Lichti, Lakewood, and John G. Papp, Yorba Linda, all of Calif., assignors to Metals, Ltd., Newport Beach, Calif.

Filed Aug. 2, 1985, Ser. No. 761,845

Int. Cl.⁴ B22F *7/00*

U.S. Cl. 419—8 **29 Claims**



1. The method of producing a metallic, ceramic, or metal ceramic, part, employing powdered material, that includes:

(a) forming two or more oversize powder material preforms respectively corresponding to two or more sections of the ultimate part to be produced,

(b) placing said preforms in adjacent relation, and

(c) consolidating said preforms at elevated temperature and pressure to weld said sections together and to reduce the sections to ultimate part size,

(d) said consolidation step carried out by embedding said preforms in a grain bed, heated to about 2000° F., and pressurizing the grain to transmit consolidating force to the preforms.

4,594,220

METHOD OF MANUFACTURING A SCANDATE DISPENSER CATHODE AND DISPENSER CATHODE MANUFACTURED BY MEANS OF THE METHOD

Jan Hasker; Pieter Hokkeling; Johannes van Esdonk, and Josef J. van Lith, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,678

Claims priority, application Netherlands, Oct. 5, 1984, 8403032

Int. Cl.⁴ B22F *3/26*

U.S. Cl. 419—27 **12 Claims**

1. A method of manufacturing a scandate dispenser cathode having a matrix at least the top layer of which at the surface consists substantially of tungsten and scandium oxide (Sc_2O_3) and having emissive material in or below said matrix, said method comprising:

(a) compressing a porous plug of tungsten powder;

(b) heating said plug in a non-reactive atmosphere and in contact with scandium to above the melting temperature of scandium;

(c) cooling said plug in a hydrogen atmosphere;

(d) pulverizing said plug to fragments;

(e) heating said fragments to approximately 800° C. and firing them at said temperature in a hydrogen atmosphere for a few to a few tens of minutes and slowly cooling said fragments in said hydrogen atmosphere;

(f) grinding the resultant scandium hydride-tungsten (ScH_2/W) fragments to powder;

(g) compressing a matrix or a top layer on a matrix of pure tungsten from said ScH_2/W powder or from a mixture of said powder with tungsten powder;

(h) then sintering and cooling one of said matrices to thereby form said cathode; and

(i) introducing emissive material into said cathode.

4,594,221

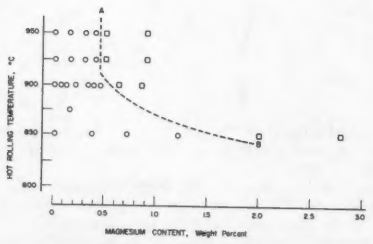
MULTIPURPOSE COPPER ALLOYS WITH MODERATE CONDUCTIVITY AND HIGH STRENGTH

Ronald N. Caron, Branford, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 26, 1985, Ser. No. 727,463

Int. Cl.⁴ C22C *9/06*

U.S. Cl. 420—485 **16 Claims**



1. A copper base alloy having an improved combination of ultimate tensile strength and electrical conductivity consisting essentially of from about 2 to about 4.8% by weight nickel, from about 0.2 to about 1.4% by weight silicon, from about 0.05 to about 0.45% by weight magnesium and the balance copper.

4,594,222

DISPERSION STRENGTHENED LOW DENSITY MA-AL

Frank W. Heck, Ramsey, N.J.; Stephen J. Donachie, New Windsor, and Howard F. Merrick, Suffern, both of N.Y., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Mar. 10, 1982, Ser. No. 356,637
Int. Cl.[4] C22C *21/00*
U.S. Cl. 420—529 22 Claims

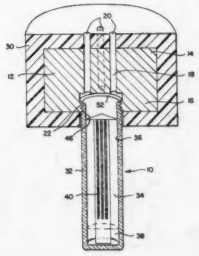
1. A dispersion strengthened, mechanically alloyed aluminum-base alloy consisting essentially, by weight, of from about 0.5 to about 4% lithium, a small but effective amount for increased strength up to about 3% oxygen, a small but effective amount for increased strength up to about 2% carbon, at least one of the elements selected from the group consisting of copper and magnesium in an amount up to about 5%, provided that when copper and magnesium are both present the total amount does not exceed about 8%, and provided that when the lithium content is above 1.5% up to about 3% and the alloy is free of copper, the magnesium level is greater than 1%, and the balance essentially aluminum, and said alloy containing about 2 up to about 8% by volume of a refractory dispersoid, said alloy being characterized in the substantially fully dense consolidated form by a combination of room temperature 0.2% yield strength of over about 345 MPa and an elongation of at least 3%.

4,594,223

DEVICE FOR DETECTING THE PRESENCE OF NONCONDENSABLE GAS IN STEAM STERILIZERS

Denis G. Dyke, Edinboro, and David A. Oshlag, Erie, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Dec. 20, 1984, Ser. No. 683,818
Int. Cl.[4] G01N *31/22*
U.S. Cl. 422—56 15 Claims



1. A device adapted for insertion into a sterilization chamber for indicating the presence of unacceptable levels of noncondensable gas comprising:

a heat sink having an upper end and a lower end, said upper end of said heat sink being adapted for such open communication with the sterilization chamber when said device is inserted therein that the steam enters said heat sink, and said heat sink being adapted to absorb latent heat from the steam until the temperature of said heat sink is in equilibrium with the ambient sterilizer temperature;

a housing defining a chamber proximate said lower end of said heat sink;

said heat sink defining a path through which steam travels from said upper end of said heat sink toward said chamber, said path being adapted to provide sufficient exposure of the steam to said heat sink so that the steam condenses within said path, releasing any noncondensable gas associated with the steam, forcing the noncondensable gas so released toward said chamber and concentrating such noncondensable gas within said chamber;

means disposed in said chamber for indicating the presence of noncondensable gas concentrated therein;

means for preventing the condensate formed from the condensed steam from effecting said indicating means but permitting the noncondensable gas concentrated within said chamber to pass to said indicating means.

4,594,224

ANALYTICAL ELEMENT

Kenichiro Okaniwa; Shozo Kikugawa, and Mikio Koyama, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 343,354, Jan. 27, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 597,818
Claims priority, application Japan, Jan. 30, 1981, 56-13203
Int. Cl.[4] G01N *21/78, 33/52*
U.S. Cl. 422—56 15 Claims

1. An analytical element, comprising a light-transmissive and liquid-impervious support, at least one reagent layer comprising a hydrophilic colloid containing at least one reagent which reacts with a component in a liquid sample, and at least one development layer having a fibrous structure provided at a position on a side of the reagent layer opposite to that of said support for permitting the component in said liquid sample to permeate into said reagent layer, said development layer having a fibrous structure being formed by coating said reagent layer with a dispersion of fibers wherein said fibers have a size of 50 to 325 mesh.

4,594,225

ELEMENTS FOR ANALYSIS OF CALCIUM

Kazumi Arai; Mikio Koyama, and Kenichiro Okaniwa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 484,238, Apr. 12, 1983, abandoned. This application Sep. 13, 1985, Ser. No. 775,709
Claims priority, application Japan, Apr. 13, 1982, 57-62219
Int. Cl.[4] G01N *21/78, 33/52*
U.S. Cl. 422—56 15 Claims

1. In an improved multilayer analytical element for the determination of calcium comprising;

a liquid impermeable, optically transparent support;

a reagent layer having first and second sides positioned with said first side on said support and containing at least one reagent capable of reacting with a calcium component in a fluid sample; and

a porous developing layer on said second side of said reagent layer, said porous developing layer being permeable to calcium from said fluid sample thereby transporting said calcium to said reagent layer,

the improvement comprising;

at least one of said reagent layer and developing layer containing a basic substance of the formula

$$M_vH_wPO_4.ZH_2O$$

wherein M is lithium, sodium or potassium; v is an integer of 2 and 3 and w is an integer of 0 or 1 provided that v plus w equals 3; and Z is $\frac{1}{2}$ when M is lithium, 0, 2 or 12 when M is sodium and 0 or 8 when M is potassium; and said reagent layer contains (i) 3,3'-bis[N,N-di(carboxymethyl-)aminomethyl]-o-cresolphthalein and (ii) 8-hydroxyquinoline or a derivative thereof.

4,594,226

GAS CHROMATOGRAPHY/MATRIX-ISOLATION APPARATUS

Gerald T. Reedy, 411 Francis St., Bourbonnais, Ill. 60914

Filed Feb. 23, 1984, Ser. No. 583,042
Int. Cl.[4] G01J *1/00;* G01N *21/01, 30/02*
U.S. Cl. 422—89 17 Claims

1. Apparatus for the collection and spectroscopic analysis of a sample in a matrix, said apparatus comprising:

an evacuated chamber having an optical window in a first wall portion thereof;

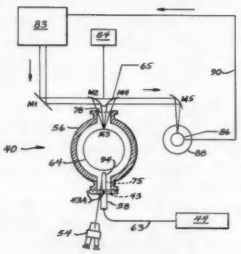
a cryogenically cooled specular sample carrier rotatably supported along its longitudinal axis within said evacuated chamber and including an external, reflecting lateral surface;

inlet means positioned in a second wall portion of said evacuated chamber adjacent to said specular sample carrier for depositing a sample material intermixed with matrix material onto the lateral reflecting surface of said sample carrier whereupon the mixture of said sample material and said matrix material solidifies on said cooled specular sample carrier, wherein said first and second wall portions form facing sections of said evacuated chamber;

illumination means for generating a beam of electromagnetic radiation;

detection means positioned outside of said evacuated chamber and optically communicating with and responsive to a modulated beam of electromagnetic radiation incident thereon for measuring the spectral characteristics thereof;

first and second coupled parabolic reflecting means having a



common focal point and positioned outside of said evacuated chamber for respectively directing said beam of electromagnetic radiation through said optical window and onto the mixture of said sample and matrix materials and for directing the beam of electromagnetic radiation reflected from said lateral reflecting surface through said optical window to said detection means wherein the spectral characteristics of said beam are measured and said sample is analyzed;

alignment means including an aperture located on the lateral reflecting surface of said sample carrier for proper positioning of said beam of electromagnetic radiation relative to the sample and matrix material mixture deposited thereon, whereby no input is provided to said detection means when said beam of electromagnetic radiation is incident upon said aperture; and

displacement means coupled to the combination of said first and second parabolic reflecting means for adjusting the position and the focal point of said beam of electromagnetic radiation relative to said alignment means on said specular sample carrier for improved spectroscopic analysis of said sample.

4,594,227

REACTION METHOD AND REACTOR THEREFOR

Kozo Ohsaki, Funabashi; Jun Zanma, Yachiyo, and Hiroshi Watanabe, Zushi, all of Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,298

Claims priority, application Japan, Sep. 28, 1982, 57-167639

Int. Cl.[4] B01J *8/02;* **F28D** *7/00*

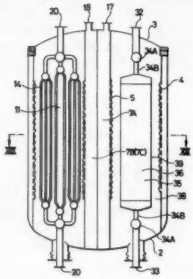
U.S. Cl. 422—148 **21 Claims**

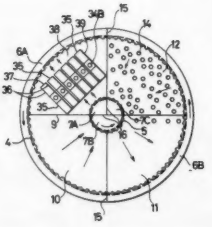
1. In a reactor having a cylindrical, upright outer shell having a top wall and a bottom wall, in which a catalytic reaction can be effected, in the presence of a granular catalyst, under conditions effective to maintain both the reactants and the product in a gaseous state at the temperatures and pressures of the reaction, the improvement which comprises:

(a) a gas-permeable, cylindrical, outer catalyst retaining wall positioned within said outer shell and spaced from the inner wall of said outer shell, thereby defining an outer, first, annular, intercylinder space between the inner surface of said outer shell, the outer surface of said catalyst retaining wall and said top and bottom walls;

(b) a gas-permeable, cylindrical, inner catalyst retaining wall positional coaxial with, iinside of and spaced from said outer catalyst retaining wall, thereby defining a second, annular, intercylinder space between said outer catalyst retaining wall, said inner catalyst retaining wall and said top and bottom walls, said inner catalyst retaining wall further defining an internal zone therewithin;

(c) at least two vertical partition walls extending in respectively different radial directions between said outer catalyst retaining wall and said inner catalyst retaining wall so as to divide said second intercylinder space into a plurality of separate chambers which have the shapes of segments





of an annulus in horizontal cross section, at least two of which chambers define at least two separate reaction chambers when said granular catalyst is packed therein;

(d) a first heat exchange means comprising a plurality of heat exchange tubes which extend vertically through at least one of said reaction chambers, said tubes being arranged in partially cylindrical groups wherein said groups are concentric with the common axis of both of said outer and inner catalyst retaining walls, with the tubes in each of said groups being spaced substantially the same radial distance from said common axis and being circumferentially spaced from each other, the respective groups of tubes being spaced different radial distances from said common axis;

(e) at least one collecting header and at least one distributing header provided respectively at opposite vertical ends of each of said reaction chambers having said heat exchange tubes therein, said headers being connected to the opposite ends of said heat exchange tubes extending through the corresponding reaction chamber in order to collect or

distribute, respectively, heat exchange fluid which passes through said heat exchange tubes;

(f) at least one fluid outlet and at least one fluid inlet which communicate with said collecting header and said distributing header respectively;

(g) at least one catalyst charging inlet and at least one catalyst discharging outlet provided to each of said reaction chambers;

(h) one or more radially extending, vertical, dividing walls provided in at least one of (i) said first intercylinder space and (ii) said internal zone within said inner catalyst retaining wall, said dividing walls being located so as to define the flow path of a reaction gas stream so that said stream is caused to flow in series through at least two of said reaction chambers in radial directions alternately radially inwardly and outwardly and said stream is caused to flow circumferentially through a circumferential flow path in at least one of (i) said first intercylinder space and (ii) said internal zone within said inner catalyst retaining wall as its flows from a first one of said reaction chambers to the next, the direction of the flow in the first chamber being radially outwardly when said stream is introduced at the radially inward end of said chamber, and the flow direction in said first chamber being radially inwardly when said stream is introduced at the radially outward end thereof;

(i) at least one vertical, radially extending, perforated plate in the circumferential flow path between said one of said reaction chambers and the next reaction chamber, which perforated plate causes said stream to flow in the circumferential directions through the orifices defined by the perforations thereof, said perforated plate constituting a radial extension of one of said vertical partition walls; and

(j) at least one reaction gas inlet and at least one product gas outlet provided in communication with said chambers.

4,594,228

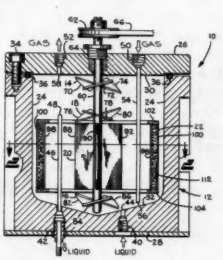
MIXING APPARATUS

Joseph M. Lambert, Jr., Aurora, and Stephen C. Paspek, Jr., North Royalton, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 612,627, May 21, 1984, abandoned. This application Oct. 21, 1985, Ser. No. 790,784

Int. Cl.⁴ B01J *8/02;* **B01F** *7/18, 7/22*

U.S. Cl. 422—218 **32 Claims**



1. A mixing apparatus capable of providing continuous stirred reactor performance comprising:

a vessel;

vertically extending agitator shaft means rotatably mounted in said vessel;

first impeller means mounted on said shaft means and positioned within said vessel immediately subjacent to the top of said vessel but sufficiently spaced from said top to rotate, said first impeller means comprising impeller blades having a downward pitch of from about 15° to about 60°;

second impeller means mounted on said shaft means and positioned within said vessel immediately superjacent to the bottom of said vessel but sufficiently spaced from said bottom to rotate, said second impeller means comprising impeller blades having an upward pitch of from about 15° to about 60°;

third impeller means mounted on said shaft means and positioned within said vessel between said first and said second impeller means;

paddle means mounted on said shaft means and positioned within said vessel between said second and said third impeller means, said paddle means comprising rectangular flat blades having their long dimension vertically aligned with said shaft means; and

means for rotating said first, second and third impeller means and said paddle means sufficiently to provide continuous stirred reactor performance.

4,594,229

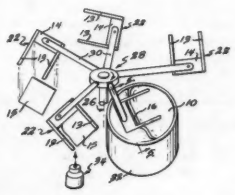
APPARATUS FOR MELT GROWTH OF CRYSTALLINE SEMICONDUCTOR SHEETS

Theodore F. Ciszek, Evergreen, and Jeffery L. Hurd, Golden, both of Colo., assignors to Emanuel M. Sachs, Cambridge, Mass.

Filed Feb. 25, 1981, Ser. No. 238,234

Int. Cl.⁴ C30B *15/34*

U.S. Cl. 422—246 **4 Claims**



1. An apparatus for growing crystals from a reservoir of a molten material comprising:

at least two spaced filaments;

bridging means interconnecting said spaced filaments;

said spaced filaments and bridging means being wettable by said molten material; and

an emersion-removal means comprising a rotation assembly having a plurality of arms radiating from a common center, each of said arms supporting at least a pair of said filaments connected by said bridging means, said emersion-removal means being adapted to emerse and remove said spaced filaments and bridging means from said molten material to form a continuous crystalline sheet of said material within the bounds of a growth area defined by said spaced filaments and bridging means upon removal thereof from said molten material.

4,594,230

RECOVERY OF COBALT

Richard A. Scheithauer; Michael J. Miller, and Clarence D. Vanderpool, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 4, 1985, Ser. No. 697,661

Int. Cl.⁴ C01G *51/00*

U.S. Cl. 423—140 **7 Claims**

1. A process for recovering cobalt from an impure cobalt bearing material, said material having a composition of in percent by weight from about 10% to about 40% chromium, from about 10% to about 40% nickel, from about 5% to about 20% iron, from about 20% to about 60% tungsten, from about 0% to about 1% silicon, and the balance cobalt, said process comprising:

(a) digesting said material in hydrochroric acid to form a solution containing essentially all of the cobalt values and

the impurities of chromium nickel and iron and insoluble material containing the impurities of tungsten and silicon;
(b) separating said solution from said insoluble material;
(c) adding to said solution an oxalate producing compound in an amount sufficient to subsequently convert essentially all of the cobalt to cobalt oxalate;
(d) adjusting the pH of the resulting oxalate treated solution with a base to from about 1.5 to about 2.0 to form a first precipitate which contains essentially all of the cobalt as cobalt oxalate and nickel impurities and a first mother liquor containing essentially all of the iron and chromium impurities of the solution; and
(e) separating said first precipitate from said first mother liquor.

4,594,231

METHOD FOR REMOVAL OF POISONOUS GASES

Hiroshi Nishino, Suita, and Toshio Aibe, Kashima, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 21, 1984, Ser. No. 653,091
Claims priority, application Japan, Sep. 22, 1983, 58-176092; Aug. 30, 1984, 59-181897
Int. Cl.[4] C01B *7/00*
U.S. Cl. 423—210 **10 Claims**

1. A method for the removal of halogens and/or hydrogen halides from a gas containing the same, which comprises contacting the gas with an adsorbent comprising an activated carbon having as supported thereon (1) one or two components included in Group I below and (2) one or more components included in Group II below:

Group	Component
I	copper oxide and zinc oxide
II	(a) alkali metal oxides (b) alkaline earth metal oxides (c) oxides of Al, Ti, V, Cr, Mn, Fe, Co, Ni, Cd and Pb

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4,594,232

PROCESS FOR PREPARING PENTAFLUOROTELLURIUM HYPOFLUORITE

Carl J. Schack, Chatsworth, and Karl O. Christe, Calabasas, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 21, 1985, Ser. No. 767,923
Int. Cl.[4] C01B *11/24, 19/00, 35/06*
U.S. Cl. 423—293 **2 Claims**

1. A method for synthesizing pentafluorotellurium hypofluorite which comprises the steps of:
A. effecting a reaction between (a) $B(OTeF_5)_3$ and (b) elemental fluorine at a temperature ranging from about 100° to 115° C.;
B. continuing said reaction for a period of time of about one to three days;
C. cooling said reaction to about −196° C.; and
D. raising the temperature of said reaction to room temperature while simultaneously separating the resultant reaction products.

4,594,233

PROCESS FOR MANUFACTURE OF AMMONIA

Roger W. Parrish, 11922 Stearns, Overland Park, Kans. 62213

Filed Jan. 4, 1985, Ser. No. 688,819
Int. Cl.[4] C01C *1/04*; C01B *2/02, 2/30*
U.S. Cl. 423—359 **5 Claims**

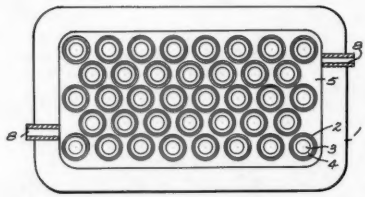
1. An improved process for making synthetic ammonia wherein a make-up synthesis gas is added to recycled unreacted gas from the catalytic conversion loop including the steps of introducing a volatile anti-icing compound into the hot make-up gas to vaporize the compound, cooling the gas and vaporized anti-icing compound to condense part of the anti-icing compound, separating the condensed anti-icing compound and dissolved impurities from the make-up gas, further cooling the make-up gas to a temperature at which the remaining anti-icing compound condenses essentially completely, separating the condensed remaining anti-icing compound from the make-up gas, mixing the resulting make-up gas at the low temperature with liquid ammonia to saturate the make-up gas with ammonia, separating unvaporized liquid ammonia from the saturated make-up gas, mixing the saturated make-up gas with recycle and passing the mixed gases directly to the catalytic ammonia synthesis converter.

4,594,234

PROCESS AND APPARATUS FOR THE PRODUCTION OF HYDROGEN CYANIDE

Reinhard Manner, Maintal; Hans Schaefer, Hanau; Carl Voigt, Rodenbach, and Wolf D. Pfeifer, Brühl, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 13, 1984, Ser. No. 589,217
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309394
Int. Cl.[4] C01C *3/02*
U.S. Cl. 423—376 **4 Claims**



1. A process for increasing the throughput of a furnace having a cooling head and thereby the space time yields of the furnace in the BMA process without changing the furnace dimensions or the necessary temperature profile comprising employing a furnace containing 38 to 66 reaction tubes and wherein the lower part of the cooling head of the furnace is constructed as a short tubular bundle heat exchanger with substantially no change in the outer geometry of the cooling head and maintaining the reaction and cooling temperature according to the temperature profile, by combination of the number and arrangement of the reaction tubes with the heating elements in the furnace chamber, said temperature profile comprising heating the ammonia and hydro-carbon reactants upon entering the reaction chamber to a temperature of at least 1000° C., maintaining the temperature substantially constant in the reaction chamber and then cooling the product leaving the reaction chamber.

4,594,235

PROCESS FOR THE PRODUCTION OF VANADIUM CARBIDE

Harry E. Gardner, Grand Junction, Colo., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 498,710, May 27, 1983, Pat. No. 4,540,562, which is a continuation of Ser. No. 298,197, Aug. 31, 1981, abandoned, which is a continuation of Ser. No. 106,737, Dec. 26, 1979, abandoned. This application Jun. 19, 1985, Ser. No. 746,374
Int. Cl.[4] C01B *31/30*
U.S. Cl. 423—440 **17 Claims**

1. A method for the manufacture of vanadium carbide comprising the steps of:

(a) providing an aqueous solution of vanadate ion;
(b) adding sulfur dioxide and a non-oxidizing acid to said aqueous solution to reduce said vanadate ion to the vanadyl ion;
(c) solvent extracting said vanadyl ion from said aqueous solution with an organic solvent comprising di-2-ethyl hexyl phosphoric acid or heptadecyl phosphoric acid;
(d) stripping said vanadyl ion from said organic solvent with ammonium hydroxide to form in three separate phases, an organic solution, an aqueous solution and a solid precipitate of vanadyl hydrate;
(e) separating the solid vanadyl hydrate from said organic and aqueous solutions;
(f) blending said solid vanadyl hydrate with carbon; and
(g) furnacing the blend of vanadyl hydrate and carbon to form vanadium carbide.

4,594,236

METHOD OF MANUFACTURING CALCIUM CARBIDE FROM POWDERED LIME AND/OR LIMESTONE

Sune Eriksson, Hofors, Sweden, assignor to SKF Steel Engineering AB, Hofors, Sweden

Filed Aug. 25, 1983, Ser. No. 526,411
Claims priority, application Sweden, Sep. 7, 1982, 8205071
Int. Cl.[4] C01B *31/32*
U.S. Cl. 423—441 **9 Claims**

1. A method for the production of calcium carbide comprising introducing powdered lime and/or limestone, optionally together with a reducing agent, with the aid of a carrier gas into a plasma gas generated by a plasma generator, after which the heated lime and/or limestone, together with any reducing agent used and the energy-rich plasma gas, is introduced into a reaction chamber substantially surrounded on all sides by a solid reducing agent in piece form, and thereby heating the lime and/or limestone directly in the reaction chamber, whereupon the following reactions $CaCO_3 \rightarrow CaO + CO_2$ and $CaO + 3C \rightarrow CaC_2 + CO$ take place with respect to any limestone introduced and the following reaction $CaO + 3C \rightarrow CaC_2 + CO$ takes place with respect to any lime introduced.

4,594,237

METHOD FOR TESTING CHEMICAL AND BIOLOGICAL SUBSTANCES

Walter Ziegler, Wyhlenweg 18, 4126 Bettingen, Switzerland

Filed Apr. 16, 1984, Ser. No. 600,873
Int. Cl.[4] G01N *33/48*
U.S. Cl. 424—3 **17 Claims**

1. A method for testing chemical and biological substances for cellulotoxic effects, comprising:
(a) treating animal tissue with the substance to be tested so as to form plasma polypi, which serve as a measure of the cellulotoxic effect,
(b) allowing the substance to have time to act on the tissue treated,
(c) excising the tissue treated and taking random samples from the excised tissue to determine the content of plasma polypi qualitatively and quantitatively over the entire excised tissue using histological sections, and
(d) comparing the number of plasma polypi produced to a comparative standard of cellulotoxic effect.

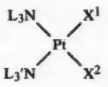
4,594,238

INHIBITION OF UNDESIRED EFFECT OF PLATINUM COMPOUNDS

Richard F. Borch, Pittsford, N.Y., assignor to Regents of University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 176,476, Aug. 8, 1980, Pat. No. 4,426,372. This application Jan. 5, 1984, Ser. No. 568,903
Int. Cl.[4] A61K *31/27*
U.S. Cl. 424—10 **11 Claims**

1. A method for inhibiting platinum (II) toxicity in a live mammal, said toxicity being due to the presence in said mammal of a toxic platinum(II) complex of the formula



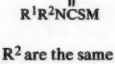
(1)

wherein X^1 and X^2 are the same or different and represent anionically ionizable leaving groups or, taken together, X^1 and X^2 can constitute a cyclic difunctional leaving group; and L_3 and L_3' are the same or different and represent the residues of amine or amine ligands, or, in combination, L_3 and L_3' together represent the residue of an aliphatic or cycloaliphatic diamine ligand;

said method comprising the steps of:

(a) administering to said mammal a platinum complex which functions as a said platinum (II) complex of formula (1) at the site of therapeutic action in vivo, in an effective physiologically active amount less than the median lethal dose for said mammal;

(b) administering to said mammal, within about 6 hours, but at least 0.5 hour after said step (a), an effective platinum (II) toxicity inhibiting amount of a platinum binding compound having the formula:



(2)

wherein R^1 and R^2 are the same or different, no more than one of the radicals R^1 and R^2 being alkyl of 1 to 6 carbon atoms, the other or both of the radicals R^1 and R^2 being lower alkyl substituted with a hydroxyl group; and M is hydrogen or M is an electro positive, ionically-bonded metal, in which case the remainder of said platinum binding compound is negatively charged.

4,594,239

METHOD FOR NEUTRALIZING OFFENSIVE CHEMICALS

Arthur W. Pluim, Jr., 602 W. Hickory, Stillwater, Minn. 55082

Filed Mar. 14, 1984, Ser. No. 589,595
Int. Cl.[4] A61K *7/135*
U.S. Cl. 424—10 **11 Claims**

1. A method for decontaminating a surface which has been exposed to urushiol, said method being for the purpose of neutralizing said urushiol, wherein said method comprises contacting said urushiol with an effective amount of a solution of a chlorine-containing compound which is capable of reacting with urushiol to produce non-allergenic reaction products, wherein said solution is selected from the group consisting of:

(a) an aqueous solution of sodium or calcium hypochlorite further containing an alkali selected from the group consisting of carbonates, bicarbonates, hydroxides, and methoxides; and

(b) an N-chloramine in a liquid organic medium selected from the group consisting of ketones, acetates, and chlorinated solvents.

4,594,240

SHEET-SHAPE ADHESIVE PREPARATION

Terushige Kawata, and Shinsuke Yamashita, both of Tokushima, Japan, assignors to Teikoku Seiyaku Kabushiki Kaisha, Kagawa; Nippon Kayaku Kabushiki Kaisha and Kaken Pharmaceutical Co., Ltd., both of Tokyo, all of, Japan

Filed Sep. 7, 1983, Ser. No. 530,070

Claims priority, application Japan, Oct. 10, 1982, 57-158588

Int. Cl.[4] A61F *13/00;* A61L *15/03;* A61K *9/70*

U.S. Cl. 424—28 5 Claims

1. A sheet-shape adhesive preparation for promoting toothmovement in orthodontics, which comprises

(A) a flexible base sheet comprised of a non-woven fabric of nylon, vinylone, lints, papers, polyvinyl chloride film, polyurethane film, ethylene-vinyl acetate copolymer film, or flexible synthetic polymer films, and

(B) a layer of a pharmaceutical composition containing

(a) a 0.002 to 2% by weight of a prostaglandin,

(b) 5 to 50% by weight of a water-soluble high molecular weight compound having a high dissolution rate in water selected from the group consisting of sodium polyacrylate, ammonium polyacrylate, hydroxyethyl cellulose, sodium carboxymethyl cellulose, sodium alginate, starch, polyvinyl alcohol and polyvinylpyrrolidone,

(c) totally 20 to 70% by weight of (i) a water-insoluble high molecular weight compound selected from the group consisting of vinyl acetate resin, ethyl cellulose, propyl cellulose, ethylmethyl cellulose and cellulose acetate phthalate and (ii) a water-soluble high molecular weight compound having a low dissolution rate in water selected from the group consisting of gelatin, alubumin, karaya gum, agar and gluten, the ratio of said water-insoluble high molecular weight compound and water-soluble high molecular weight compound having a low dissolution rate being in the range of 1:9 to 6:4 by weight,

(d) 5 to 50% by weight of a softening agent, and

(e) 5 to 20% by weight of water on the flexible base sheet.

4,594,241

ANTI-LEISHMANIAL PHARMACEUTICAL FORMULATIONS

Leburu S. Rao, Swanley, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 405,875, Aug. 6, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 669,035

Claims priority, application United Kingdom, Aug. 10, 1982, 8124347

Int. Cl.[4] A61K *9/52, 9/66*

U.S. Cl. 424—38 4 Claims

1. A pharmaceutical formulation consisting essentially of an anti-leishmanial effective amount of sodium stibogluconate encapsulated in liposomes consisting of dipalmitoylphosphatidyl choline, cholesterol and dicetyl phosphate in a molar ratio of 4.5:4.5:1 respectively, the weight ratio of the lipid mixture to encapsulated said sodium stibogluconate being from 1:1.6 to 1:0.25 said liposomes being suspended in a continuous aqueous phase containing a pharmaceutically acceptable salt and having a tonicity at least twice that of human blood and having a pH of about 5.5 to 7 whereby the leakage rate of initially encapsulated sodium stibogluconate is less than 50% by weight after storage at 25° C. for 6 weeks from encapsulation.

4,594,242

DENTIFRICE COMPOSITION

Takeshi Naganuma; Natsumi Miyagawa, both of Odawara; Toshiyuki Ozawa, Chigasaki, and Kazutoshi Tamura, Hiratsuka, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 689,892

Claims priority, application Japan, Mar. 8, 1984, 59-44651

Int. Cl.[4] A61K *7/16, 7/20*

U.S. Cl. 424—57 11 Claims

1. A dentifrice composition comprising: calcium hydrogenphosphate anhydride whose crystallite has an average size of 300 to 3,500 angstroms as measured by X-ray diffractometry wherein the calcium hydrogenphosphate anhydride has a density of 2.650 to 2.885 g/cm^3, a specific surface area of 2.5 to 20 m^2/g as measured by the BET method, and an average particle size of 2 to 30 μm; and an aluminum oxide having an average particle size of 0.5 to 10 μm.

4,594,243

BASE COMPOSITION FOR MEDICAMENT AND PHARMACEUTICAL COMPOSITION FOR EXTERNAL MEDICATION

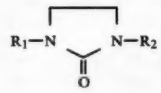
Susumu Satoh; Ichiro Kobayashi; Yumiko Takakura, and Mitsuru Tamada, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Jul. 25, 1984, Ser. No. 634,479

Int. Cl.[4] A61K *31/74, 31/415, 31/21, 31/075, 31/01*

U.S. Cl. 424—78 5 Claims

1. A base composition for a medicament, which base composition is capable of enhancing the percuteneous absorption of the medicament comprising: an effective amount of at least one adjuvant selected from the group consisting of a saturated hydrocarbon containing 5 to 20 carbon atoms which may be substituted by halogen, an alcohol ester of alilphatic carboxylic acid containing 12 to 18 carbon atoms, an ether containing 8 to 16 carbon atoms, a dimethylpolysiloxane having a viscosity of 25° C. of not more than 6 centistokes and a cyclic polydimethylsiloxane having a viscosity at 25° C. of not more than 6 centistokes; and an effective amount of an imidazolidinone derivative represented by the general formula:



wherein R_1 and R_2 each are a lower alkyl group.

4,594,244

ANTIGENIC MATERIALS

Thomas Lehner, Barnet, England, and Abu S. M. Giasuddin, Zaria, Nigeria, assignors to Council of Governors of the United Medical and Dental Schools of Guy's and St. Thomas's Hospitals, London, England

Filed Feb. 10, 1984, Ser. No. 579,117

Claims priority, application United Kingdom, Feb. 14, 1983, 8303994

Int. Cl.[4] A61K *39/09, 39/40;* C12P *21/00*

U.S. Cl. 424—87 14 Claims

1. Antigen X having the following characteristics:

1. It has a molecular weight as determined by SDS-PAGE in the range of 3,800–4,500 daltons,

2. It is immunogenic in experimental animals, forming precipitating antibodies,

3. It reacts with antisera raised against antigen I, antigen I/II or antigen II as well as with antisera raised against itself, but does not react with antisera raised against antigen III,

4. It is distinct from serotype polysaccharide antigens, glycerol teichoic acid, dextran and similar glucans, and does not synthesise glucans from sucrose,

5. It is substantially of a proteinaceous nature,
6. It absorbs ultra-violet light strongly between 220 and 250 nm (maximum at 230 nm),
7. Its immunogenic activity is destroyed by the enzyme pronase.
8. It is substantially free from antigen I/II.
9. It induces production of helper T cells but not of suppressor T cells.

4,594,245

AUGMENTING FACTORS FOR HUMAN ANTIBODY PRODUCTION AND PROCESS FOR PEPARING THE SAME

Takato Yoshida; Soichi Haraguchi; Teruaki Hongo, and Yukio Koide, all of Hamamatsu, Japan, assignors to Hamamatsu University School of Medicine, Hamamatsu, Japan

Filed Jan. 25, 1984, Ser. No. 573,616

Claims priority, application Japan, Jul. 25, 1983, 58-134502

Int. Cl.[4] A61K *35/18;* **C07K** *15/06;* **C12N** *5/02;* **C12P** *21/00*

U.S. Cl. 424—101 **7 Claims**

1. Augmenting and enhancing factor for human antibody production wherein the factor is obtained from the supernatant of cultured human lymphocytes and the factor has physicochemical and biological properties as follows:

(a) molecular weight of 2,000–4,000;

(b) passage through a cellulose dialysis membrane having a diameter of 6 mm, a thickness of 0.0508 mm and a porosity diameter of 24A;

(c) stability at pH 2–11;

(d)

(i) stability on heating at 30° C. for 60 minutes, at 56° C. for 30 minutes and at 100° C. for 2 minutes,

(ii) stability to six repetitions of freeze-thawing with freezing at −80° C. and thawing at 37° C.;

(e)

(i) inactivation on treatment with proteinase K at 37° C. for 60 minutes,

(ii) stability to a treatment with ribonuclease A at 37° C. for 60 minutes; and

(f)

(i) augmentation and enhancement of the production of immunoglobulins, IgG and IgM by human lymphocytes;

(ii) exhibition of no activity of T-cell growth factor (TCGF);

(iii) exhibition of no activity of B-cell growth factor (BCGF), and (iv) exhibition of no activity of B-cell differentiation factor (BCDF).

4,594,246

PHARMACEUTICALLY-ACCEPTABLE AMINE SALTS OF 6-β-HALOPENICILLANIC ACIDS

Welf von Daehne, Rungsted Kyst, Fed. Rep. of Germany, assignor to Leo Pharmaceutical Products, Ballerup, Denmark

Continuation of Ser. No. 207,614, Nov. 17, 1980, Pat. No. 4,446,144, which is a continuation-in-part of Ser. No. 145,880 May 1, 1980, Pat. No. 4,511,512. This application Dec. 23, 1983, Ser. No. 564,901

Claims priority, application United Kingdom, May 21, 1979, 7917665; Sep. 5, 1979, 7930819; Nov. 29, 1979, 7941252; Feb. 27, 1980, 8006681

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

Int. Cl.[4] C07D *499/44;* **A61K** *31/43*

U.S. Cl. 424—114 **19 Claims**

1. A pharmaceutically-acceptable amine salt selected from the group consisting of the pivmecillinam salt of 6β-bromopenicillanic acid; the pivmecillinam salt of 6β-iodopenicillanic acid; the bacmecillinam salt of 6β-bromopenicillanic acid; the bacmecillinam salt of 6β-iodopenicillanic acid, the penethamate salt of 6β-bromopenicillanic acid; and the penethamate salt of 6β-iodopenicillanic acid.

4,594,247

SYNERGISTIC ANTIBACTERIAL COMPOSITIONS AND METHOD OF TREATMENT OF INFECTIONS CAUSED BY MULTIPLE ANTIBIOTIC-RESISTANT ORGANISMS

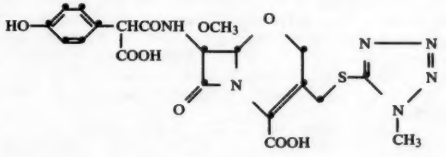
Gordon L. Brier, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 332,774, Dec. 21, 1981, Pat. No. 4,452,778, which is a continuation-in-part of Ser. No. 135,390, Mar. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 36,263, May 4, 1979, abandoned. This application Jan. 27, 1984, Ser. No. 574,442

Int. Cl.[4] A61K *35/00*

U.S. Cl. 424—114 **2 Claims**

1. A synergistic antibacterial composition comprising 1 part by weight, as the diacid, of a compound of the formula



or a pharmaceutically acceptable salt thereof, and from about 0.1 to about 16 parts by weight of piperacillin.

4,594,248

CL-1577-B_4 COMPOUND, ITS PRODUCTION AND USE

John H. Wilton; Gerard C. Hokanson, and James C. French, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 15, 1985, Ser. No. 712,294

Int. Cl.[4] A61K *35/74;* **C12P** *1/06*

U.S. Cl. 424—117 **3 Claims**

1. The compound designated CL-1577-B_4 having the characteristics:

a pale yellow solid having an elemental analysis corresponding to 47.8% C; 5.74% H; 3.88% N; 30.66% O (by difference); and 11.92% S;

an ultraviolet absorption spectrum showing absorption at 315 nm (inflection), 271 nm (a=10.8), 213 nm (inflection);

an infrared absorption spectrum showing principal absorption peaks at 3700, 3500, 3180, 2975, 2930, 1735, 1682, 1670, 1603, 1508, 1500, 1383, 1369, 1302, 1154, 1100, 1075, 1020, 990, and 859 reciprocal centimeters;

a 200 MHz proton magnetic resonance spectrum in deuteriochloroform showing principal signals at 1.10 (doublet), 1.34 (doublet), 1.39 (doublet), 1.51 (broad double doublet), 2.10 (singlet), 2.13 (doublet of double doublets), 2.30 (multiplet), 2.49 (singlet), 2.50 (doublet of doublets), 2.76 (multiplet), 3.39 (singlet), 3.88–3.4 (multiplet), 3.99 (doublet of doublets), 4.11 (doublet of double doublets), 4.29 (singlet), 4.63 (doublet), 4.96 (doublet of doublets), 5.68 (broad doublet), 5.79 (doublet of doublets), 5.88 (doublet), 6.17 (multiplet), 6.22 (doublet), and 6.56 (doublet of doublets) parts per million downfield from tetramethylsilane;

and a 90.56 MHz ^{13}C magnetic resonance spectrum in deuteriochloroform showing principal signals at 193.8, 156.0, 149.8, 136.0, 132.7, 130.3, 126.3, 123.6, 100.8, 99.9, 98.4, 89.5, 84.1, 83,8, 79.5, 79.2, 76.8, 72.5, 71.6, 70.8, 70.7, 68.7, 68.6, 67.3, 63.1, 57.1, 56.3, 56.1, 52.5, 47.3, 40.5, 37.8, 34.5, 24.0, 22.9, 22.4, 20.2, 18.5, and 14.8 parts per million downfield from tetramethylsilane.

4,594,249

METHOD OF ALTERING INTOXICATING EFFECTS OF ALCOHOL

Richard W. Procter, Minneapolis, and Stanton L. Anondson, St. Louis Park, both of Minn., assignors to 21st Century Marketing, Inc., St. Louis Park, Minn.

Filed Jun. 14, 1985, Ser. No. 745,019
Int. Cl.[4] A61K *33/44*
U.S. Cl. 424—125 8 Claims

1. A method for alleviating the effects of consumption of beverage alcohol which comprises administering to the drinker of alcohol at least one dose of activated charcoal in an amount equal to at least about 5 to 15 milligrams of charcoal per kilogram of body weight, said charcoal being administered substantially concurrently with the consumption of alcohol.

4,594,250

EXTRACTION OF FRUIT, VEGETABLE AND MEAT PRODUCTS WITH A POLYETHER-BASED POLYMER

Friedrich K. Lautenschlaeger, Mississauga, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Continuation of Ser. No. 441,784, Nov. 15, 1982, abandoned. This application Sep. 20, 1984, Ser. No. 652,428
Claims priority, application United Kingdom, Nov. 21, 1981, 8135154
Int. Cl.[4] C12H *1/04;* A23L *1/27, 2/30;* A23B *7/00*
U.S. Cl. 426—257 26 Claims

1. A method of treating a substance being a fruit, vegetable or meat product, or a derivative thereof, to extract one or more ingredients therefrom, comprising exposing the substance in liquid and/or gaseous form to an extractive effective amount of a substance consisting essentially of a polyether-based polymer selected from:

(i) organo-ether homopolymers containing alkylene oxide units of the general formula

$$-(-C(R_1)(R_2)-)_n-O-C(R_3)(R_4)-C(R_5)(R_6)-$$

where n is zero or an integer and R_1 to R_6 are the same or different and are selected from alkyl groups, aryl groups and hydrogen atoms, and further that when n is more than 1 the R_1 radicals may be the same or different and the R_2 radicals may be the same or different; and

(ii) organo-ether copolymers and reaction products containing a preponderance of alkylene oxide units having the above general formula, not being polyetherurethanes or polyetherureas.

4,594,251

PREPARATION OF TAR-DEPLETED LIQUID SMOKE TREATED CASINGS

Myron D. Nicholson, Lemont, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 483,295, Apr. 8, 1983, abandoned. This application Apr. 4, 1984, Ser. No. 595,601
Int. Cl.[4] A22C *13/00*
U.S. Cl. 426—262 19 Claims

1. A method for preparing a tar-depleted smoke colored and smoke flavored tubular casing which comprises (1) thermally decomposing wood in a oxygen-controlled atmosphere to generate smoke-vapors, (2) selectively solvent extracting the tars from the generated smoke vapors with a water immiscible organic solvent, (3) absorbing the tar-extracted smoke vapors into an aqueous medium to provide a tar-depleted liquid smoke solution, and (4) contacting a tubular casing wall with the tar-depleted liquid smoke solution.

4,594,252

METHOD FOR MAKING DIPEPTIDE SWEETENED READY-TO-EAT CEREAL

Michael J. Niemczyk, Palatine, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Sep. 11, 1984, Ser. No. 649,555
Int. Cl.[4] A23L *1/164*
U.S. Cl. 426—307 40 Claims

1. A method for making a sweetener coated ready-to-eat cereal comprising the steps of:

(a) heating an edible fatty material having a Wiley Melting Point in the range of about 20° C. to 45° C. and an iodine value of less than about 40 to a temperature at which it is liquid;

(b) dispersing a finely ground solid dipeptide sweetener in the range of about 25 microns to 500 microns in diameter into the heated fatty material in an amount in the range of about 0.5% to 7.0% based on the weight of the fatty material;

(c) applying the dispersion of sweetener and fatty material onto a ready-to-eat cereal base heated to a temperature of at least about 25° C. above the melting point of the edible fatty material and in a quantity sufficient to provide an amount of dipeptide sweetener on the ready-to-eat cereal base in the range of about 0.05% to 0.5% based on the weight of the ready-to-eat cereal base; and

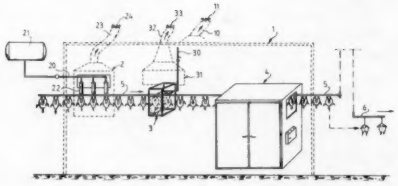
(d) cooling the sweetened ready-to-eat cereal to a temperature at which the fatty material is solid.

4,594,253

METHOD FOR MINCING AND PREPACKAGING MINCED MEAT UNDER CONTROLLED ATMOSPHERE AND TEMPERATURE

Maurice Fradin, Résidence le Jean Bart - 19 Esplande de la Mer, 85160 Saint Jean de Monts, France

Filed Mar. 21, 1984, Ser. No. 601,776
Int. Cl.[4] A22C *21/00, 21/04;* B65B *31/02*
U.S. Cl. 426—393 3 Claims



1. A process for continuous treatment of poultry carcasses for the manufacture of minced meat, comprising the steps of:

(i) injecting carbon dioxide snow inside the warm carcasses coming from the abattoir, after evisceration thereof;

(ii) immediately performing a singeing operation on the carcasses inside which carbon dioxide snow has been injected;

(iii) cooling the singed carcasses;

(iv) de-boning the singed and cooled carcasses;

(v) mincing the de-boned carcasses;

(vi) shaping the minced meat and packaging it into containers,

(vii) the mincing, shaping and packaging steps being carried out in a substantially thermally insulated and gas-tight enclosure within which the temperature is maintained at about 0° to −4° C. by introducing controlled quantities of carbon dioxide snow inside the enclosure while evacuating controlled quantities of the air and other gases contained within the enclosure.

4,594,254

FLAVORING WITH METHYLTHIOALKANOIC ACID ESTERS

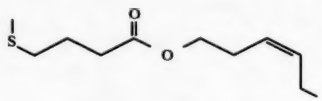
Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 715,344, Mar. 25, 1985, Pat. No. 4,557,941. This application Aug. 23, 1985, Ser. No. 768,701

Int. Cl.[4] A23L *1/226, 1/235*

U.S. Cl. 426—535 **1 Claim**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from about 0.001 parts per million up to about 250 parts per million of a compound having the structure:



4,594,255

SUGAR-FREE CHEESECAKE FILLING AND DRY MIX FOR PREPARATION THEREOF

Mildred N. Wilson, 133 Old Kings Hwy., Wilton, Conn. 06897, and Wayne L. Steensen, 6 Edelweiss La., Ridgefield, Conn. 06877

Filed Sep. 10, 1985, Ser. No. 774,329

Int. Cl.[4] A23L *1/187, 1/04;* **A23C** *19/086*

U.S. Cl. 426—578 **15 Claims**

1. A dry mix capable of producing a stable, sugar-free filling for cheesecake when admixed with milk, without need for cooking or heating of the admixture, comprising a particulate and intimate admixture of milk solids in an amount of from about 30 to 65% by weight of the dry mix, fat in an amount of from about 5 to about 20% by weight of the dry mix, a pregelatinized starch thickening component, a source of cheese flavor and cheese solids, phosphate gelling agents capable of interacting with milk proteins to form a gelatinous structure in the cheesecake filling, an emulsifier component, a non-sugar sweetener in an amount sufficient to provide an acceptable degree of sweetness to the cheesecake filling, and from about 10 to about 35% by weight of a maltodextrin having a dextrose equivalent in the range of from about 3 to about 15 and a bulk density of at least about 10 pounds per cubic foot.

4,594,256

PRODUCT AND PROCESS FOR PRODUCING AN AGGLOMERATED INSTANT COFFEE HAVING A ROAST GROUND APPEARANCE

Valery B. Zemelman, Wilton, Conn.; Gary L. Burgess, Ridgefield; Rudolf A. Vitti, Dumont, both of N.J.; Todd M. Forman, Croton-on-Hudson, N.Y.; Anthony M. Batchelor, Banbury, England, and Yvon N. Leblanc, Ste-Martine, Canada, assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,332

Int. Cl.[4] A23F *5/38*

U.S. Cl. 426—594 **19 Claims**

1. A process for producing an agglomerated instant coffee product having a roasted and ground appearance comprising;

a. milling spray-dried instant coffee to produce a milled powder of an average particle size of 25 to 75 microns with a standard deviation of 35% to 75% wherein the spray-dried product is produced from extracts of 20 to 65% soluble solids;

b. adjusting the cohesiveness of the powder to a cohesive index of 0.20 to 0.85 so that it will flow and will bind together with slight compaction;

c. compacting the cohesive adjusted powder to form a loosely bound, structurally intact cluster from the cohesive adjusted powder, said cluster have a size of about 800 to 2100 microns;

d. fusing the outer surface of the cluster to a depth of from about 5 to 30 microns; and

e. drying the fused clusters to produce an agglomerated instant coffee having a density of from 0.20 to 0.28 gms/cc, a hardness value of less than 8 and a color of 17 to 24 Lumetron units.

4,594,257

PRODUCT AND PROCESS USING COLLOIDAL PARTICLES FOR PRODUCING AN AGGLOMERATED INSTANT COFFEE HAVING A ROAST AND GROUND APPEARANCE

Yvon N. Leblanc, Ste-Martine, Canada; Valery B. Zemelman, Wilton, Conn., and Gary L. Burgess, Ridgefield, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,348

Int. Cl.[4] A23F *5/38*

U.S. Cl. 426—594 **21 Claims**

1. A process for producing an agglomerated instant coffee product having a roasted and ground appearance comprising;

a. milling spray-dried instant coffee to produce a milled powder of an average particle size of 30 to 75 microns with a standard deviation of 35% to 75% wherein the spray-dried product is produced from extracts of 20 to 65% soluble solids;

b. adding roasted coffee colloidal particles in an amount from 1 to 15 weight percent based on the weight of the powder to the powder so that it will flow and will bind together with slight compaction;

c. compacting the colloidal particles and powder to form a loosely bound, structurally intact cluster from the colloidal particles and powder, said cluster have a size of about 800 to 2100 microns;

d. fusing the outer surface of the cluster to a depth of from about 5 to 30 microns; and

e. drying the fused clusters to produce an agglomerated instant coffee having a density of from 0.20 to 0.28 gms/cc, a hardnes value of less than 8 and a color of 17 to 24 Lumetron units.

4,594,258

PRODUCT AND PROCESS USING OIL FOR PRODUCING AN AGGLOMERATED INSTANT COFFEE HAVING A ROAST AND GROUND APPEARANCE

Rudolf A. Vitti, Dumont; Gary L. Burgess, Ridgefield, both of N.J., and Valery B. Zemelman, Wilton, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,761

Int. Cl.[4] A23F *5/38*

U.S. Cl. 426—594 **22 Claims**

1. A process for producing an agglomerated instant coffee product having a roasted and ground appearance comprising;

a. milling spray-dried instant coffee to produce a milled powder of an average particle size of 30 to 75 microns with a standard deviation of 35% to 75% wherein the spraydried product is produced from extracts of 20 to 65% soluble solids;

b. adding oil to the powder wherein the oil is added from 0.01 weight percent to 1.0 weight based on the weight of the milled powder so that the powder will flow and will bind together with slight compaction;

c. compacting the oiled powder to form a loosely bound, structurally instant cluster from the cohesive adjusted powder, said cluster have a size of about 800 to 2100 microns;

d. fusing the outer surface of the cluster to a depth of from about 5 to 30 microns; and

e. drying the fused clusters to produce an agglomerated instant coffee having a density of from 0.20 to 0.28

gms/cc, a hardness value of less than 8 and a color of 17 to 24 Lumetron units.

4,594,259

TEMPERABLE CONFECTIONERY COMPOSITIONS HAVING IMPROVED MOUTH MELT SUITABLE FOR CHOCOLATE

Joseph S. Baker, Cincinnati, and Phillip F. Pflaumer, Ross, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 21, 1984, Ser. No. 684,515
Int. Cl.[4] A23G *1/00, 3/00*
U.S. Cl. 426—613 **13 Claims**

1. A flavored confectionery composition, which comprises a flavor enhancing amount of a flavor component and from about 20 to about 45% by weight of the composition of a fat component having an St:P weight ratio of about 0.8 or less and consisting essentially of:

(1) from 0 to about 70% by weight cocoa butter;

(2) up to about 20% by weight butter fat; and

(3) from about 30 to 100% by weight of a fat having an St:P weight ratio of about 0.2 or less and which comprises:

(a) at least about 70% SOS trigylcerides;

(b) from about 4 to about 20% combined SUU/UUU/SLS triglycerides,

(c) about 8% or less SLS triglycerides;

(d) about 9.5% or less SSO triglycerides;

(e) about 2.5% or less SSS triglycerides; and

(f) up to about 4% other glycerides;

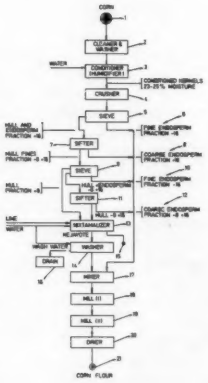
wherein S is stearic (St) or palmitic (P); U is oleic (O) or linoleic (L).

4,594,260

PROCESS FOR PRODUCING NIXTAMALIZED CORN FLOUR

M. Cristina Vaqueiro, and Pedro Reyes, both of Mexico City, Mexico, assignors to Imit, A.C., Mexico

Filed Sep. 21, 1984, Ser. No. 652,927
Int. Cl.[4] A23L *1/10*
U.S. Cl. 426—622 **13 Claims**



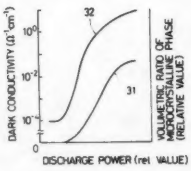
1. A process for producing nixtamalized corn flour comprising the steps of: cleaning whole corn kernels, conditioning the cleaned kernels by incorporating moisture therein sufficient to soften the hulls and to hydrate the starch contained in the endosperm, crushing the thus conditioned kernels to form a particular corn material, classifying the particulate corn material to produce a hull fraction isolated from a fraction comprising endosperm and germ, subjecting only the said hull fraction to a nixtamalization step, draining spent nixtamalization liquor, washing the nixtamalized hull fraction, mixing said nixtamalized hull fraction with the untreated fraction comprising endosperm and germ, grinding the mixture, and drying the ground mixture to obtain a nixtamalized corn flour.

4,594,261

METHOD FOR PRODUCING THIN FILM SEMICONDUCTOR DEVICE

Masakazu Ueno, and Takeshige Ichimura, both of Kanagawa, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 554,656, Nov. 23, 1983. This application Sep. 30, 1985, Ser. No. 781,378
Claims priority, application Japan, Nov. 25, 1982, 57-205536
Int. Cl.[4] H01L *21/205, 31/18*
U.S. Cl. 427—39 **2 Claims**



1. A method for forming a semiconductor device, comprising the steps:

providing an amorphous semiconductor layer having substantially no microcrystalline phase;

forming a junction region on said amorphous semiconductor layer having no microcrystalline phase by glow discharge decomposition in which the discharge power is gradually increased over the course of formation, whereby the microcrystalline phase content of said junction region gradually increases in the direction of thickness away from said amorphous semiconductor layer; and

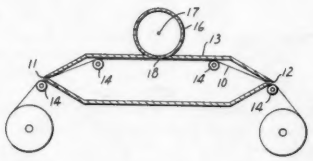
forming on said junction region an amorphous semiconductor layer having a microcrystalline phase content substantially the same as the microcrystalline phase content at the interface between said junction region and said amorphous semiconductor layer having a microcrystalline phase.

4,594,262

ELECTRON BEAM ADHESION-PROMOTING TREATMENT OF POLYESTER FILM BASE

Curtis L. Kreil, St. Paul, and LuAnn Sidney, White Bear Township, Ramsey County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 627,812, Jul. 5, 1984, abandoned. This application Jun. 17, 1985, Ser. No. 745,812
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—44 **22 Claims**



1. Method for coating a polyester film base with a curable organic coating, which method comprises the steps of:

(1) continuously passing uncoated polyester film base, consist-

ing essentially of saturated polyester, through an inert atmosphere containing less than 100 ppm oxygen while;

(2) exposing the film base to irradiation by an electron beam to subject the film base to an absorbed dosage of at least 1 Mrad; and

(3) applying a curable organic coating to the surface of the polyester film base;

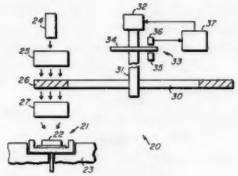
whereby the polyester film, after step (2), has been rendered substantially more adherent to organic coatings than such film which has not been so treated, and this greater adherence lasts for prolonged periods, of at least one week, during storage at room temperature in air.

4,594,263

LASER MARKING METHOD AND ABLATIVE COATING FOR USE THEREIN

Lee E. Folk, Phoenix, and Reginald K. Asher, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 17, 1984, Ser. No. 682,129
Int. Cl.[4] A01L *21/48*; C23C *18/34*
U.S. Cl. 427—53.1 **5 Claims**



1. A method of marking a metal surface comprising the steps of:

forming a layer of electroless nickel on said surface;

exposing said layer of electroless nickel to an acid solution capable of converting at least a portion of said electroless nickel layer to a radiant energy absorptive form;

baking said converted electroless nickel layer at an elevated temperature for a predetermined length of time; and

exposing a portion of said converted, baked electroless nickel layer to radiant energy sufficient to substantially remove said exposed portion.

4,594,264

METHOD FOR FORMING GALLIUM ARSENIDE FROM THIN SOLID FILMS OF GALLIUM-ARSENIC COMPLEXES

John E. Jensen, Newbury Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 20, 1984, Ser. No. 673,467
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—53.1 **24 Claims**

1. A method for depositing GaAs on a substrate comprising the steps of:

applying to said substrate a thin liquid film of a gallium-arsenic complex solution, said solution selected from the group of complexes having the formula X_3GaAsR_3 where X is chlorine, bromine, iodine, phenyl, methyl, or trifluoromethyl and R is hydrogen, phenyl, benzyl, methyl or trifluoromethyl, and a compatible solvent in which said complex is dissolved;

evaporating said solvent from said liquid film to form a thin solid film of said gallium-arsenic complex on said substrate; and

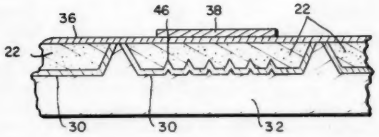
irradiating said thin solid film in an atmosphere free of oxygen and moisture with ultraviolet light of a sufficient wavelength and a sufficient intensity to photochemical convert said gallium-arsenic complex to gallium arsenide to thereby provide deposition of gallium arsenide on said substrate.

4,594,265

LASER TRIMMING OF RESISTORS OVER DIELECTRICALLY ISOLATED ISLANDS

Nicolaas W. Van Vonno; Richard Hull, both of Melbourne, and Paul S. Reinecke, Indialantic, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed May 15, 1984, Ser. No. 610,583
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—53.1 **36 Claims**



1. A method of fabricating dielectrically isolated islands for subsequent use with laser radiation processing comprising:

forming isolation grooves in a first surface of a semiconductor substrate;

forming a plurality of indentures in said first surface;

forming a layer of dielectric material on said first surface, in said indentures and on said grooves;

forming a layer of support material on said dielectric layer overfilling said grooves;

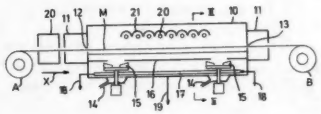
removing portions of said substrate to a second surface opposite said first surface to form dielectrically isolated islands of said substrate exposed at said second surface.

4,594,266

PROCESS AND AN APPARATUS FOR BAKING AN ORGANIC COATING WHICH HAS BEEN APPLIED TO A SUBSTRATE

Jean-Paul E. Lemaire, Neuville en Condroz, and Lucien P. Renard, Seraing, both of Belgium, assignors to Cockerill Sambre S.A., Seraing, Belgium

Filed Jul. 11, 1984, Ser. No. 629,866
Claims priority, application Luxembourg, Jul. 14, 1983, 84911
Int. Cl.[4] B05D *3/06*; C23C *14/00*; B05B *5/00*; F26B *3/32*
U.S. Cl. 427—55 **13 Claims**



1. A process for treating an organic coating of paint, ink or varnish applied to a substrate consisting of polymers dispersed in a solvent, said process comprising the steps of:

radiating in a heating furnace said organic coating with short-wavelength infra-red rays in an inert gas atmosphere without acting chemically on the polymers contained therein to evaporatively remove the organic solvent from the coating, and

condensing the removed organic solvent such that air is prevented from being introduced into the heating furnace to prevent explosions by air/solvent mixture, and to increase the evaporation content of the atmosphere of the heating furnace to thereby increase the rate of solvent removal from the coating, and reduce the cost of subsequent solvent condensation.

4,594,267
PROCESS FOR PRODUCING COBALT-CONTAINING MAGNETIC IRON OXIDE POWDER

Ichiro Honma, Moriyama; Masaharu Hirai, Shiga; Masatoshi Amano, Moriyama, and Nobusuke Takumi, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Continuation of Ser. No. 557,587, Dec. 2, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,775
Claims priority, application Japan, Dec. 8, 1982, 57-215172
Int. Cl.[4] C01G *49/06*
U.S. Cl. 427—127 4 Claims

1. A process for producing a cobalt-containing magnetic iron oxide powder having improved stability of coercivity under aging by coating a ferrous compound and a cobalt compound on the surface of particles of a base powder of acicular magnetic gamma-Fe_2O_3 powder, Fe_3O_4 powder or powder of a berthollide compound obtained by partially reducing γ-Fe_2O_3, said base powder containing 0.1 to 1% by weight of phosphorus, which process comprises the successive steps of:

(1) preparing an aqueous slurry of said particles of base powder;

(2) coating a ferrous compound on the surface of said particles of lease powder by reacting a ferrous salt with an alkali;

(3) coating a cobalt compound on the surface of the first coated particles by reacting a cobalt salt with an alkali;

wherein both steps are carried out so that the OH group concentration of the slurry of steps (2) and (3) containing the ferrous compound-coated particles or the cobalt compound-coated particles is within the range of 0 to 3 mol/l the coating steps being carried out at a temperature below the boiling point, and in a non-oxidizing atmosphere;

(4) filtering the slurry of coated particles resulting from step (3) to form a wet cake;

(5) washing the wet cake; and then

(6) heat-treating the wet cake at a temperature of 30° C. to 200° C. to dry the cake, said cobalt containing magnetic iron oxide exhibiting a smaller change of coercivity with time than the corresponding cobalt containing magnetic iron oxide prepared as above but where the sequence of steps (2) and (3) is reversed.

4,594,268
METHOD FOR THE CONTROL OF DUST USING METHACRYLATE CONTAINING EMULSIONS AND COMPOSITIONS

Ross C. Kirwin, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Mar. 29, 1985, Ser. No. 717,778
Int. Cl.[4] B05C *1/16;* B05D *7/00*
U.S. Cl. 427—136 14 Claims

1. A method of suppressing dust comprising contacting a dust-producing material with at least one methacrylate polymer selected from the group consisting of polymers prepared from:

(1) monomers having the generic formula $CH_2{=}C(CH_3)COOR$, wherein R is selected from the group consisting of H and any straight or branched chain alkyl group having less than or equal to 12 carbon atoms, alone or in combination; and

(2) one or more of the monomers of group (1) in combination with any monomer having the generic formula $CH_2{=}CH\text{-}COOR^2$, wherein R^1 is H or any straight or branched alkyl group having less than 6 carbon atoms, alone or in combination,

wherein said methacrylate polymer is applied as an aqueous emulsion containing 0.1–50%, by weight, active polymer or as a hydrophobic liquid/polymer composition containing 0.1–30%, by weight, active polymer, and wherein said methacrylate polymer is added at a dosage of at least 0.001 lb/square yard for surface treatment or 0.001 lb/metric ton for treatment on a weight basis.

4,594,269
CHEMICALLY RESISTANT THERMOSENSITIVE RECORDING PAPER

Masahiro Miyauchi, Tokyo; Sadao Morishita, Ibaraki; Fumio Okumura, Kunitachi, and Masahiro Higuchi, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Division of Ser. No. 333,779, Dec. 23, 1981, Pat. No. 4,415,627. This application Mar. 14, 1983, Ser. No. 475,376
Claims priority, application Japan, Dec. 23, 1980, 55-182557; Jan. 7, 1981, 56-981
Int. Cl.[4] B41M *5/18*
U.S. Cl. 427—150 7 Claims

1. A process for producing a chemically resistant thermosensitive recording paper which comprises:

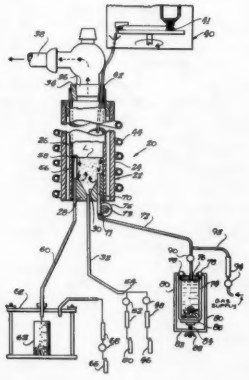
coating on a substrate a thermosensitive coating color consisting of (a) a dye precursor and (b) a color developer capable of coloring said dye precursor on heating as principal constituent elements and drying the thermosensitive coating color coated on the substrate to form a thermosensitive layer and

coating on the thermosensitive layer a solution containing at least one member selected from the group consisting of alumina sol, colloidal silica and a mixture of alumina sol with colloidal silica and drying the solution coated on the thermosensitive layer to form an overcoat layer.

4,594,270
BED SAMPLER FOR A HIGH-TEMPERATURE FLUIDIZED BED

Lionel H. Brooks, Austin, Tex., assignor to Carbomedics, Inc., Austin, Tex.

Filed Aug. 31, 1984, Ser. No. 646,569
Int. Cl.[4] B05C *3/08, 3/04*
U.S. Cl. 427—213 9 Claims



7. A method of sampling the contents of a particle bed in fluidized bed apparatus of the type comprising an enclosure holding a bed of particles; means for causing flow of a gaseous atmosphere carrying a material for forming a particle coating, having relatively lesser density than the densities of said particles, upward through said bed of particles to fluidize them, and means for adding seed particles to said to said bed; said sampling method comprising the steps of;

(a) flowing said atmosphere through said bed and adding said seed particles;

(b) withdrawing particles from the top of said bed to maintain a predetermined bed level;

(c) sampling the contents of said bed below said predetermined level at different levels through the use of a tube received in an interference fit in an opening in said enclo-

sure, said tube being slidable with respect to said enclosure; and

(d) analyzing the samples withdrawn at said different levels.

4,594,271

PROCESS FOR COATING INORGANIC PARTICLES WITH CONDENSATING POLYMERS

Pieter C. Scholten, Waalre; Fred W. Snyder, Eindhoven, both of Netherlands, and Howard Sorkin, Glen Ridge, N.J., assignors to U.S. Philips Corporation and North American Philips Corporation, both of New York, N.Y.

Continuation-in-part of Ser. No. 685,657, Dec. 24, 1984, abandoned. This application Oct. 15, 1985, Ser. No. 787,408

Int. Cl.[4] B05D *7/00*

U.S. Cl. 427—221 **14 Claims**

1. A process for the production of coatings of condensation polymers on inorganic particles by polymerization of a monomer, capable of being polymerized to a condensation polymer in the presence of said inorganic particles, said process comprising:

(a) forming a first stable suspension of at least one solid monomer, capable of being polymerized to a condensation polymer when heated, in a first organic liquid inert during said polymerization and containing a minor amount of a dispersing agent stable during said polymerization,

(b) forming a second stable suspension of finely divided inorganic particles in a second organic liquid inert during said polymerization, miscible with said first organic liquid, and containing a minor amount of a dispersing agent stable during said polymerization and

(c) adding said first suspension to said second suspension while stirring and heating said second suspension to the polymerization temperature of said monomer and while keeping the rate of addition of said first suspension to said second suspension so low that the solubility of said monomer in said heated second suspension is not exceeded.

4,594,272

PROCESS AND DEVICE FOR MANUFACTURING SHEET METAL OR GALVANIZED STEEL STRIP DEVOID OF A PURE ZINC COATING ON AT LEAST ONE SIDE

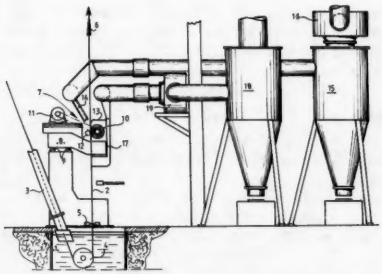
Robert Haaser, Truchtersheim, France, assignor to Union Siderurgique du Nord et de l'Est de la France (USINOR), Puteaux, France

Filed May 29, 1985, Ser. No. 739,080

Claims priority, application European Pat. Off., May 30, 1984, 84401121.3

Int. Cl.[4] B05D *3/12;* **C23C** *2/16, 2/22*

U.S. Cl. 427—349 **13 Claims**



1. A process for manufacturing a strip of hot galvanized sheet steel devoid of a coating of pure Zn or a coating based on Zn on at least one side of the strip, said process comprising the steps of passing the strip continuously through a conventional dipping galvanization bath, wiping by pneumatic means a part of the coating of liquid Zn deposited on the strip, and subjecting at least one side of said strip to a mechanical action for completely removing the coating based on Zn which is not alloyed to the iron, by allowing to subsist only a thin iron-zinc alloy, said mechanical action being exerted on the layer of coating based on zinc which is still liquid by means of a brush having bristles, at least said bristles being energetically cooled.

5. A brushing device for manufacturing a strip of hot galvanized sheet steel devoid of a coating of pure Zn or a coating based on Zn on at least one side of the strip, said brushing device being for combination with a bath of zinc and comprising a support located alongside a path of the strip leaving said bath and above the level of the surface of the bath of zinc, a rotary cylindrical brush carried by said support and having bristles which have ends thereof in contact with a first surface of the strip in front of which surface the brush is placed, and at least a counter support roller in contact with a second surface of the strip opposed to said first surface, a casing surrounding said brush and for connection to means for producing a forced circulation of a gaseous cooling fluid in said casing.

4,594,273

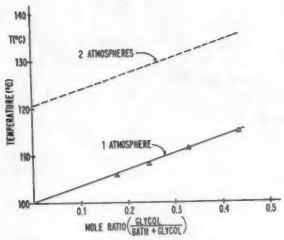
HIGH-RATE ELECTROLESS DEPOSITION PROCESS

Saad K. Doss, Gilroy, and Peter B. P. Phipps, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,518

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—443.1 **3 Claims**



1. In a process for the electroless deposition of a nickel-phosphorus alloy by contacting a suitable substrate with an aqueous solution containing nickel ions and hypophosphite ions while maintaining the solution at a predetermined process temperature, the solution for the electroless deposition of the nickel-phosphorus alloy being of the type wherein the rate of deposition of the alloy is substantially independent of the concentration of ions over a predetermined concentration range, an improvement comprising the steps of increasing the ambient pressure of the gas above the surface of the solution and heating the solution to a temperature higher than the previous predetermined process temperature but below the solution boiling point.

4,594,274

END-DRESSINGS FOR TUBULAR CASINGS

Hugo De Jong, Lommel, and Hugo Thijs, Hechtel, both of Belgium, assignors to Teepak, Inc., Oak Brook, Ill.

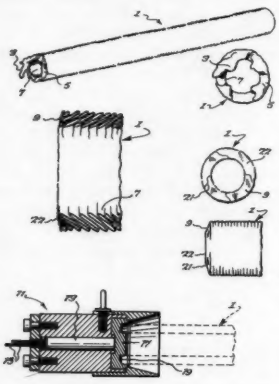
Filed Dec. 7, 1983, Ser. No. 559,165

Int. Cl.[4] A22C *13/02*

U.S. Cl. 428—36 **9 Claims**

1. A method of end-dressing a shirred strand of tubular food casing film, which comprises the steps of providing a shirred strand of tubular food casing film, said strand having loose, unshirred or residual casing film on at least one terminal end thereof, and forming an end-dressing on said strand at the affected terminal end(s), said dressing being formed from said

loose, unshirred or residual casing film by compressing said loose, unshirred or residual casing film against the terminal



edge of the shirred strand while heating to a temperature below the fusion temperature of said casing film.

4,594,275

ELONGATED COLUMNAR OR ROD-LIKE STRUCTURE, AND METHOD OF ITS MANUFACTURE

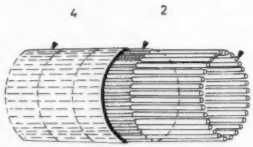
Gerd Stolz, Oberheinriet, Fed. Rep. of Germany, assignor to Winfried Matter, Forst, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,585

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328146

Int. Cl.[4] B32B *1/08*

U.S. Cl. 428—36 **21 Claims**



1. Columnar or rod-like or bar-like material of a selected cross section comprising

a plurality of base bodies (**2, 5, 6, 10, 17*a*, 18, 19, 32, 33**) of the selected cross-sectional shape, the base bodies being formed with longitudinal openings (**3, 7, 8**) adjacent the circumference thereof;

a plurality of canes (**1, 11**) located in the openings and being slidably positioned therein, the base bodies being spaced along the length of the material, leaving gaps therebetween along which only the canes extend;

a bonding agent embedding the canes and in the openings of the base bodies; and

a wrapping (**4**) of a tape or web-like material wrapped about the canes in the regions of the openings and bonded to the canes and, where present, to the base bodies by the bonding agent.

15. Method of making a columnar or rod-like or bar-like material of a selected cross-sectional shape comprising

providing a plurality of base bodies (**2, 5, 6, 8, 17*a*, 18, 19, 32, 33**) having the desired cross-sectional shape;

forming longitudinal openings adjacent the outer circumference of the base bodies;

inserting canes (**1, 11**) in the longitudinal openings, the canes having a cross section which, at least in part, fits into the openings, positioning the base bodies spaced from each other, the base bodies holding the canes in position in the openings, and hence in position with respect to each other;

applying a curable or hardenable bonding agent to the canes and to the base bodies, while penetrating the openings, to embed the canes in the bonding agent; and

wrapping a tape or web-like wrapping about the bonding agent and embedding the canes prior to curing of the bonding agent to bond the tape or web to the canes and to the region of the base bodies; and

and permitting the bonding agent to cure.

4,594,276

PRINTED, REMOVABLE BODY TATTOOS ON A TRANSLUCENT SUBSTRATE

Keith E. Relyea, St. Joseph, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 9, 1984, Ser. No. 597,923

Int. Cl.[4] B41M *3/12*; B32B *3/18*

U.S. Cl. 428—40 **5 Claims**

1. An imitation body tattoo applique article consisting essentially of:

(A) a translucent, porous, non-woven compacted organic polymeric filamentary substrate layer,

(B) on one side of said substrate layer a pressure sensitive adhesive layer, and

(C) on the other side of said substrate layer a water-resistant printed image,

wherein said substrate is cut so that the edge of the applique article is the perimeter of the image.

4,594,277

ADHESIVE TAPES HAVING A FILM BACKING OF POLYPROPYLENE OR OTHER OLEFINIC POLYMER OR COPOLYMER AND RELATED MANUFACTURING PROCESS

Graziano Galli, Formia, and Felice Pina, Milan, both of Italy, assignors to Manuli Autoadesivi S.p.A., Milan, Italy

Continuation of Ser. No. 498,518, May 26, 1983, abandoned. This application Jan. 18, 1985, Ser. No. 692,874

Claims priority, application Italy, Jun. 11, 1982, 21842 A/82

Int. Cl.[4] A61F *13/20*

U.S. Cl. 428—40 **3 Claims**

1. An adhesive tape with reduced unwinding noise, said tape comprising:

a film backing of polypropylene or other olefinic polymer or copolymer, having an adhesive side and a non-adhesive side;

a primer and an adhesive layer on said adhesive side;

a release layer on said non-adhesive side; said non-adhesive side of said film backing having been treated so that it has a surface tension not lower than 33 dynes/cm.

4,594,278

ACOUSTICAL PANELS

Michael T. Nixon, 2810 N. Urbandale La., Plymouth, Minn. 55447

Continuation-in-part of Ser. No. 572,466, Jan. 20, 1984. This application Apr. 1, 1985, Ser. No. 718,235

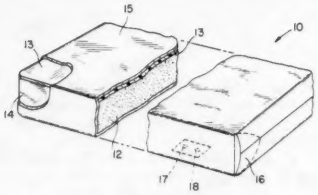
The portion of the term of this patent subsequent to Mar. 4, 2003, has been disclaimed.

Int. Cl.[4] B32B *1/04*

U.S. Cl. 428—68 **24 Claims**

1. An acoustical panel comprised of an inner core fabricated of a loosely woven fibrous material; at least one middle layer disposed on at least one side of said inner core, said middle layer formed of a material which enhances durability without significantly reducing the sound absorption characteristics of the inner core; edge support means surrounding the edge surfaces of said inner core and said middle layer; and an outer

layer made of a plastic film material which is impermeable to moisture and air, and which, upon exposure to heat, shrinks to



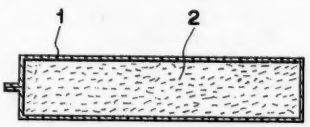
achieve smooth, tight surfaces about said inner core, said middle layer and said edge support means.

4,594,279

HEAT INSULATOR

Hiroshi Yoneno, Nara; Yoshihiro Matsuo, Neyagawa, and Shoichi Ishihara, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 26, 1984, Ser. No. 654,558
Claims priority, application Japan, Sep. 28, 1983, 58-181013
Int. Cl.[4] B32B *1/06, 5/16*
U.S. Cl. 428—69 **2 Claims**



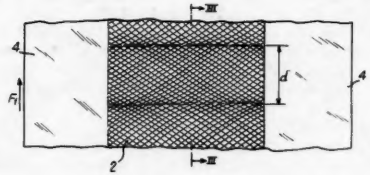
1. A heat insulator comprising a vacuum-filled container containing a mass of flaky pulverized particles of expanded pearlite having a thickness of not greater than 0.5 micrometer and an average particle size of not greater than 100 micrometers, said vacuum in the container being within the range of 0.01 to 10 Torr.

4,594,280

EXPANDED PERFORATED SHEET HAVING INTEGRAL UNEXPANDED SIDES AND METHOD OF MANUFACTURING THE SAME

Claude Coyon, and Bernard Bernet, both of Montbard, France, assignors to La Metal Deploye, Clamart, France

Filed Feb. 2, 1984, Ser. No. 576,271
Claims priority, application France, Feb. 3, 1983, 83 01699
Int. Cl.[4] B21D *31/04, 13/10, 53/04*
U.S. Cl. 428—135 **20 Claims**



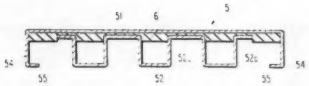
1. A perforated and expanded sheet material structure comprising, at least one perforated and expanded portion, and at least one integral solid border strip parallel to the direction of the expanded portion, said border strip having a length parallel to the direction of expansion, which is less than the length of the surface of the expanded portion, as measured in a direction parallel to the direction of expansion of the sheet.

4,594,281

LIGHTWEIGHT IMPACT ABSORBING PANEL

Kousuke Haraga, Hyogo; Katutoshi Hattori, and Kazumi Yamamoto, both of Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,324
Claims priority, application Japan, Apr. 5, 1984, 59-50169[U]
Int. Cl.[4] B32B *3/28*
U.S. Cl. 428—172 **6 Claims**



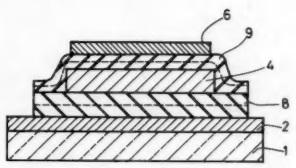
1. In a panel comprising:
a front plate made of a rigid material;
a back plate mounted on the rear face of said front plate and having a corrugated cross-section, said back plate being made of a rigid material; and
a reinforcing layer made of a synthetic resin material adhering opposed faces of said front plate and said back plate to each other;
the improvement wherein said front plate is less than 1.2 mm in thickness, said synthetic resin is urethane resin with a Shore D hardness in the range of 40° to 60°, said synthetic resin reinforcing layer includes hollow particles therein, more than 5% weight of the total weight of the hollow particles are of a diameter ranging from 150 mu m to 250 mu m, to create a reinforcing layer of relatively low specific density, of high impact strength and of good vibration prevention quality, and wherein the reinforcing layer covers the entire rear face of said front plate, the thickness of the reinforcing layer adhering to opposed faces of the front plate and back plate is in the range from 0.5 mm to said front plate at portions other than that adhering the 5 mm.

4,594,282

LAYER STRUCTURE OF THIN-FILM ELECTROLUMINESCENT DISPLAY PANEL

Masashi Kawaguchi, Nara; Kinichi Isaka, Yamatokoriyama; Yoshihiro Endo, and Hiroshi Kishishita, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 400,976, Jul. 22, 1982, abandoned. This application Dec. 1, 1983, Ser. No. 557,376
Claims priority, application Japan, Jul. 31, 1981, 56-121004
Int. Cl.[4] H05B *33/12*
U.S. Cl. 428—216 **26 Claims**



1. A thin-film electroluminescent element comprising:
a thin-film electroluminescent layer;
first and second dielectric layers surrounding the electrolu-

minescent layer, the first dielectric layer being disposed on a smooth surface and the second dielectric layer being disposed on an uneven surface;

the thickness of the first dielectric layer being thicker than that of the second dielectric layer; and

first and second electrodes provided on the dielectric layers, respectively.

21. A thin film electroluminescent element comprising:

a thin film electroluminescent layer;

first and second dielectric layers surrounding said electroluminescent layer, said first dielectric layer being disposed on a smooth surface and said second dielectric layer being disposed on an uneven surface;

first and second electrodes provided on said dielectric layers; and

the thickness of said first dielectric layer being greater than that of said second dielectric layer such that $1<(d1/d2)<3$ and $d1+d2$ equals about 4000 Å, wherein d1 represents the thickness of said first dielectric layer and d2 represents the thickness of said second dielectric layer, and such that the generation of dielectric breakdown is substantially prevented.

4,594,283

SHOEMAKING MATERIAL AND PRODUCTION THEREOF

Toshihide Ohigashi, Nara, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 20, 1985, Ser. No. 713,899

Claims priority, application Japan, Apr. 5, 1984, 59-68585

Int. Cl.[4] B32B *7/02*

U.S. Cl. 428—218 **8 Claims**

1. A shoemaking material, which comprises:

a laminate comprised of at least two webs, each of said webs being formed by bonding main fibers with binder fibers, said binder fibers being at least partly softened or melted,

wherein a first web has a density lower than about 0.4 g/cm^3 and a ratio of main fibers to binder fibers of 55:45 to 90:10 and a second webb has a density higher than about 0.3 g cm^3 and a ratio of main fibers to binder fibers of 45:55 to 10:90, the difference between said densities being greater than above 0.1 g/m^3, and

wherein weight of said laminate is from about 200 to 1500 g/cm^3.

4,594,284

FOUNDATION FOR CARD CLOTHING

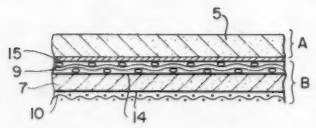
Mutuo Nakagawa, Takarazuka; Isao Ikkanzaka, Amagasaki, and Yasuyuki Uchida, Takarazuka, all of Japan, assignors to Kanai Juyo Kogyo Co., Ltd., Itami, Japan

Filed May 22, 1984, Ser. No. 612,786

Claims priority, application Japan, May 30, 1983, 58-95296; May 30, 1983, 58-95297

Int. Cl.[4] B32B *5/06, 5/14, 5/18*

U.S. Cl. 428—234 **10 Claims**



1. A foundation for card clothing comprising a surface layer having at least one layer selected from a needle punch felt, a foamed sheet of rubber, and a foamed sheet of resin, and a base layer formed by the lamination of at least one layer each of cloth woven from an aromatic polyamide fiber yarn at least as warp, a needle punch felt and cloth woven from a polyester fiber yarn at least as warp.

4,594,285

FLEXIBLE MEMBRANE MATERIAL

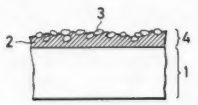
Yoshitaka Osawa; Akira Nishimura; Junki Morimi, and Mitsunobu Tobe, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 22, 1984, Ser. No. 663,538

Claims priority, application Japan, Oct. 22, 1983, 58-197938

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—240 **14 Claims**



1. A flexible membrane material comprising

a flexible base material and

a water repellent layer on the base material, wherein the water repellent layer is a rubber layer comprising a substantially uniform dispersion of finely-divided particles of a fluorinated resin in at least a portion thereof, the fluorinated resin being a fluorocarbon polymer.

4,594,286

COATED FABRIC

James M. McKinney, North Augusta, and John G. Hodson, Graniteville, both of S.C., assignors to Graniteville Company, Graniteville, S.C.

Filed May 7, 1985, Ser. No. 731,315

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—245 **40 Claims**

1. A coated fabric which is tear resistant, abrasion resistant, water repellant and flame retardant formed of a substrate woven from yarns of synthetic fibers, a liquid coating containing flame retardant chemicals, a polymeric binder, and a thermosetting blocked urethane prepolymer applied to the woven substrate and cured by heat, whereby the thermoset coating is tightly adhered to the woven fabric.

4,594,287

DENSIFIED CARBONACEOUS BODIES WITH IMPROVED SURFACE FINISHES

Edward E. Hucke, Ann Arbor, Mich., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 689,842, Jan. 9, 1985, which is a continuation-in-part of Ser. No. 568,066, Jan. 4, 1984, which is a division of Ser. No. 305,777, Sep. 25, 1981, Pat. No. 4,425,316. This application Jul. 29, 1985, Ser. No. 760,271

Int. Cl.[4] C08J *9/02*

U.S. Cl. 428—320.2 **6 Claims**

1. A structure which is capable of being converted into a densified carbonaceous artifact, said structure being composed of a body which is essentially a fine grained, isotropic carbon with the pores thereof filled with a liquid impregnant containing furfural and/or furfural alcohol, an acid polymerization catalyst, and one or more pore-forming agents comprising a polyalkylene oxide adduct or the polymerization products of an impregnant as aforesaid.

4,594,288

OPTICAL LENSES HAVING A SCRATCH-RESISTANT COATING

Bernard Dobigny, Drancy, and Jean-Pierre Mazzone, Saint Maur, both of France, assignors to Essilor International, Creteil, France

Filed Aug. 1, 1984, Ser. No. 636,549
Claims priority, application France, Aug. 3, 1983, 83 12780
Int. Cl.[4] B32B *27/36;* C08F *26/06;* G02C *7/16;* B29D *11/00*
U.S. Cl. 428—339 11 Claims

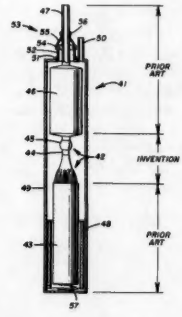
1. An optical lens constituted by a substrate of a polymer of copolymer of allyl-N-ethylene glycol carbonate, wherein said lens is further provided at least on one face with a thin film of a copolymer of the monomer allyl-N-ethylene glycol carbonate and of an allyl monomer, said thin film being obtained by applying to said substrate while still incompletely polymerized the blend of said monomer allyl-N-ethylene glycol carbonate and said allyl monomer and overmolding.

4,594,289

ELONGATED TUBESHEETS FOR HOLLOW FIBER TYPE BATTERY CELLS AND METHOD OF FABRICATING THE SAME

Daniel O. Clark, Benicia; Paul A. Damrow, Concord, and Floris Y. Tsang, Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 30, 1984, Ser. No. 635,778
Int. Cl.[4] D02G *3/00;* H01M *10/39*
U.S. Cl. 428—368 12 Claims



1. A bundle of spaced apart, ceramic, hollow fiber lengths having end portions gathered compactly together and potted in a generally columnar body of a coherent slurry of a powdered ceramic material in a volatilizeable liquid,

the unpotted portions of said fiber lengths defining a larger diameter part of said bundle,

the average distance adjacent said potted portions being about ½ or less of the average distance between adjacent said fiber portions defining said larger diameter part of said bundle, and

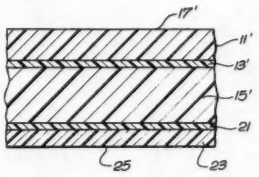
said slurry being convertible, by drying, heating and cooling, to a solid ceramic tubesheet through which said potted portions pass in sealing engagement therewith and which together with those potted portions contitutes a composite structure.

4,594,290

IMPACT RESISTANT LAMINATE

William F. Fischer, Orange; Donald P. LeMasters, Buena Park, and William C. Harbison, Lake Forest, all of Calif., assignors to Swedlow, Inc., Garden Grove, Calif.

Continuation of Ser. No. 447,018, Dec. 6, 1982, abandoned. This application Feb. 20, 1985, Ser. No. 704,133
Int. Cl.[4] B32B *7/02, 27/40, 17/10*
U.S. Cl. 428—212 2 Claims



1. A transparent laminate having a high ballistic response comprising:

a transparent first ply disposed in the direction of an expected impact and consisting essentially of polymethyl methacrylate, with modulus of elasticity of 300,000 psi or greater;

a transparent second ply disposed immediately behind the first ply and consisting essentially of polyurethane, with tensile elongation of 100 percent or greater and modulus of elasticity of 20,000 psi or less;

a transparent third ply disposed immediately behind the fourth ply and consisting essentially of polycarbonate, with ultimate tensile elongation of 30 percent or greater and modulus of elasticity of 150,000 psi or greater;

wherein the second and fourth plies both have uniform thicknesses of at least about 10 mils, the first, third and fifth plies all have thicknesses substantially greater than the thicknesses of the second and fourth plies, and the respective first, third and fifth plies have uniform thicknesses in a proportion of about 2:4:1.

4,594,291

CURABLE, PARTIALLY ADVANCED EPOXY RESINS

James L. Bertram, Lake Jackson; Louis L. Walker, Clute; Jody R. Berman, and James A. Clarke, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 631,676, Jul. 17, 1984, abandoned. This application Mar. 25, 1985, Ser. No. 716,279
Int. Cl.[4] C08G *59/62, 59/14*
U.S. Cl. 428—414 94 Claims

1. A partially advanced epoxy resin composition comprising a product resulting from reacting a composition comprising

(A) at least one relatively low equivalent weight epoxy resin having an average of more than one vicinal epoxy group per molecule;

(B) at least one extender material having an average of about two active hydrogen atoms per molecule which are reactive with vicinal epoxy groups;

(C)

(1) optionally, one or more catalysts for promoting the reaction between components (A) and (B);

(2) one or more epoxy resin curing agents selected from the group consisting of amines, mercaptans, carboxylic acids, carboxylic acid anhydrides, aromatic sulfonic acid amides and imidazoles; or

(3) a combination of (1) and (2); and

(D) one or more stabilizer materials; wherein

(i) components (A), (B), (C) and (D) are present in quantities which provide from about 0.1 to about 0.9 active hydrogen equivalent in component (B) per epoxide equivalent in com-

ponent (A); from about 0.05 to about 0.9 equivalent of component (C2) per epoxide equivalent in component (A); from about zero to about 0.1 mole of component (C1) per epoxide equivalent in component (A); the combined equivalents of components (B) and (C2) per epoxide equivalent in component (A) is from about 0.15:1 to about 1.1:1 and component (D) is present in a quantity which is sufficient to reduce the viscosity increase of the resultant partially advanced epoxy resin composition during storage; and

(ii) the composition is partially advanced to the extent that the melt viscosity has increased to a value which is greater than about 20 percent greater than the melt viscosity of the initial mixture of components (A), (B), (C) and (D) with the proviso that said partially advanced composition is melt flowable at or below about 250° C. and if said increase in melt viscosity is greater than about 1250 percent, a solvent is required.

4,594,292

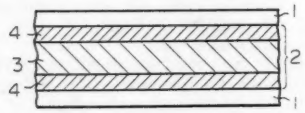
METAL-RESIN-METAL SANDWICH LAMINATES SUITABLE FOR USE IN PRESS FORMING

Hiroyuki Nagai, Nishinomiya; Minoru Nishihara, Kyoto, and Toshiaki Shiota, Takatsuki, all of Japan, assignors to Sumitomo Metal Industries, Ltd. and Sumitomo Metal Chemical Co., Ltd., both of Osaka, Japan

Continuation-in-part of Ser. No. 458,944, Jan. 18, 1983, abandoned. This application Oct. 9, 1984, Ser. No. 658,917

Int. Cl.⁴ B32B *15/08*

U.S. Cl. 428—458 **16 Claims**



1. A rigid metal-resin-metal sandwich laminate capable of withstanding 180° bending with a threshold bending inner diameter of zero, said laminate comprising a resin layer sandwiched between and bonded to outer metal layers, characterized in that the resin layer is comprised of a core sheet sandwich between outer resin sheets, said core sheet being made of a resin which exhibits plastic behavior and which is bonded to said outer resin sheets with or without an adhesive layer and said outer resin sheets being made of a ductile resin which does not exhibit yielding behavior or necking when stretched, and said outer resin sheet being made of a copolymer or polymeric blend of a lower α-olefin selected from ethylene and propylene with from about 15% to about 50% by weight for ethylene or from about 20% to about 85% by weight for propylene based on the copolymer or blend of one or more α,β-ethylenically unsaturated monomers.

4,594,293

CLAD MATERIAL WITH UNHEATED WELDING ADHESION

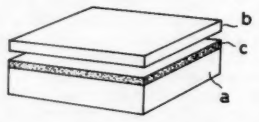
Toru Kawauchi, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1985, Ser. No. 716,381

Claims priority, application Japan, Apr. 2, 1984, 59-63220

Int. Cl.⁴ B22F *7/02*

U.S. Cl. 428—548 **9 Claims**



1. A clad material being an unheated welding adhesion from an aqueously interspersed powder of one or more metals, said powder being of a grain size which avoids aggregation and coarsening and forms adhesive bonding between two or more materials to be clad under unheated welding conditions.

4,594,294

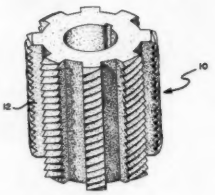
MULTILAYER COATING INCLUDING DISORDERED, WEAR RESISTANT BORON CARBON EXTERNAL COATING

Erwin Eichen, West Bloomfield, and James Flasck, Rochester, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 535,352, Sep. 23, 1983. This application Oct. 9, 1984, Ser. No. 658,831

Int. Cl.⁴ B22F *5/00*

U.S. Cl. 428—552 **8 Claims**



1. A coated article comprising:

(a) a substrate;

(b) a multilayer coating on said substrate, said multilayer coating comprising:

(i) a first titanium nitride layer on the substrate;

(ii) a titanium carbide layer atop the first titanium nitride;

(iii) an alumina layer atop the titanium carbide layer;

(iv) a second titanium nitride layer atop the titanium carbode layer; and

(v) an external layer of disordered boron and carbon.

4,594,295

CUT SHEET METAL LAMINATION ELEMENT COMPRISED OF TWO PARTS AND HAVING THREE LEGS

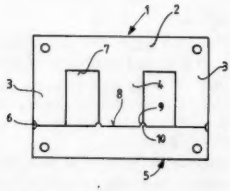
Brüno Waasner, Bamberger Str. 85, Forchheim, Fed. Rep. of Germany (8550), and Rolf-Dietrich Waasner, Forchheim, Fed. Rep. of Germany, assignors to Bruno Waasner, Forchheim, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 611,857

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318370

Int. Cl.⁴ H01F *27/26*

U.S. Cl. 428—581 **15 Claims**



1. In a laminated core comprised of cut sheet metal lamination elements each of which is comprised of two sheet metal parts, with three legs and two crosslinks, the first sheet metal part having two outer legs and a middle leg connected to one of the crosslinks and the second sheet metal part being the other crosslink, the two outer legs of the first sheet metal part

and the crosslink of the second sheet metal part are rigidly attached to each other when the two sheet metal parts are pressed together, and the free end of the middle leg of the first sheet metal part interacts with the crosslink of the second sheet metal part by means of an interengaging short projection and a cooperating region, the improvement wherein:

at least one projection is provided in the form of a small, narrow projection on one of said sheet metal parts and at least one cooperating region is provided on the other sheet metal part, said at least one projection and cooperating region having sizes and configurations that do not match but have an interfering fit prior to said pressing together so that after the two sheet metal parts are pressed together the middle leg is held securely by means of a force fit between said at least one projection and cooperating region and deformation of at least one of said projection and cooperating region to prevent the free end of the middle leg from moving perpendicularly to the plane of said middle leg.

4,594,296

MAGNETIC RECORDING MEDIUM

Kiyoshi Noguchi; Kouji Kobayashi, and Suguru Takayama, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 16, 1983, Ser. No. 562,071
Claims priority, application Japan, Dec. 25, 1982, 57-234813
Int. Cl.⁴ G11B *5/66*
U.S. Cl. 428—610 **7 Claims**

1. A magnetic recording medium which comprises a magnetic layer formed on a substrate and comprising Co, or Co and one to three elements selected from the group consisting of Ni, Cr and O, wherein, when the magnetic layer is divided equally into four portions in the direction of the thickness of the magnetic layer, the density of the portion located farthest from the substrate is greater by at least 20% than the average density of three other portions.

4,594,297

FUEL CELL USING NOVEL ELECTROLYTE MEMBRANE

Anthony J. Polak, Lake Zurich, and Allyson J. Beuhler, Indian Head Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1983, Ser. No. 566,844
The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.
Int. Cl.⁴ H01M *8/00, 8/10*
U.S. Cl. 429—13 **17 Claims**

1. An apparatus for producing electricity from a fuel gas having a gaseous component which is capable, in the presence of a catalytic agent, of dissociating to yield hydrogen ions comprising:

(a) a thin film organic-inorganic membrane which comprises a single phase blend of (1) from about 1% to about 70% by weight of a heteropoly acid and salts thereof having the generic formula:

$$A_m[X_xY_yO_z].nH_2O$$

in which X and Y are selected from the group consisting of boron, aluminum, gallium, silicon, germanium, tin, phosphorus, arsenic, antimony, bismuth, selenium, tellurium, iodine, and the first, second, third and fourth transition metal series of the Periodic Table and where Y is dissimilar from X, A is selected from the group consisting of hydrogen, ammonium, sodium, potassium, lithium, rubidium, cesium, beryllium, magnesium, calcium, strontium and barium, m is an integer of from 1 to 10, y is an integer of from 6 to 12 based on x taken as 1, z is an integer of from 30 to 80 and n is an integer of from 3 to 100 and, (2) from about 99% to about 30% by weight of a polymer compatible with said heteropoly acid or salt thereof selected from the group consisting of poly(vinyl alcohol), poly(vinyl fluoride), polyethylene oxide, polyethyleneimine, polyacrylic acid, polyethylene glycol, cellulose acetate, polyvinylmethylethyl ether and phenol formaldehyde resins;

(b) a membrane housing comprising a fuel gas chamber and an oxidant gas chamber separated by a substantially imporous partition comprising said membrane defined in element (a), said membrane having a first surface in communication with said fuel gas chamber and a second surface in communication with said oxidant gas chamber;

(c) two separate portions of catalytic agent effective to promote dissociation and combination, one portion in contact with said first surface of said membrane and one portion in contact with said second surface of said membrane; and,

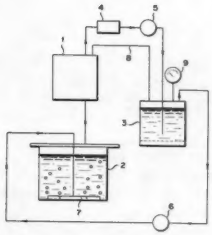
(d) means for forming electrical connection in operative contact with said catalytic agent in contact with said first surface of said membrane and in operative contact with said catalytic agent in contact with said second surface of said membrane.

4,594,298

ZINC-CHLORIDE CELL

Shunji Shimizu, Tokyo; Yuichi Watakabe, Yokohama; Kunihiko Fujiwara, Yokohama, and Toshiaki Yabumoto, Yokohama, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 21, 1985, Ser. No. 736,443
Claims priority, application Japan, Jun. 1, 1984, 59-112355
Int. Cl.⁴ H01M *10/34*
U.S. Cl. 429—72 **6 Claims**



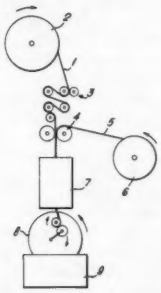
1. A zinc-chloride cell wherein a gas phase in a cell container comprises a gas mixture of chlorine gas and an inert gas to allow easy control of an internal pressure of said cell during operation thereof, a device is included to trap the gas mixture and to blow the trapped gas mixture into an electrolyte, and during charging of said cell, the gas mixture is trapped and the

trapped gas mixture is blown into the electrolyte so as to reduce a chlorine concentration in the electrolyte.

4,594,299
ELECTRODE ARTICLE

John A. Cook, Faringdon; George B. Park, and Robert H. McLoughlin, both of Swindon, all of England, assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 618,110, Jun. 7, 1984, abandoned. This application Nov. 1, 1984, Ser. No. 667,035
Claims priority, application United Kingdom, Nov. 2, 1983, 8329212
Int. Cl.[4] H01M *4/08, 2/14*
U.S. Cl. 429—129 28 Claims

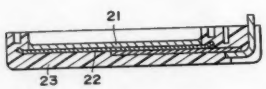


1. An article comprising sensitive electrode material protected by a layer of protective material, the electrode material having been deformed so as to decrease its thickness, thereby substantially increasing its surface area, while in contact with the protective material and the protective material being ready to function as an electrode separator when the article is used to provide an electrode in an electrical device, and being capable of sufficient ionic conductivity to provide an electrolyte when the article is used as aforesaid.

4,594,300
LEAD STORAGE BATTERY

Yuji Morioka; Sigeru Yamasita, both of Hyogo, and Yoshiaki Yano, Sumoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jan. 3, 1985, Ser. No. 688,496
Int. Cl.[4] H01M *4/56*
U.S. Cl. 429—225 2 Claims

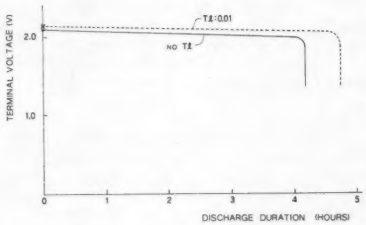


1. A lead storage battery comprising:
a casing made of a plastic material;
a cover made of a plastic material adaptable to the casing to form a battery housing;
an electro-collecting board including lead;
electrode plates closely contacted with said electro-collecting board, and
wherein said electrode plates are integrally formed with said electro-collecting board to form a unitary structure, and wherein said unitary structure is formed by supplying a mixture in the form of slurry of active materials and a liquid to said electro-collecting board and then dried, and wherein said electro-collecting board is integrally formed with said battery housing.

4,594,301
LEAD-ACCUMULATOR AND ACTIVE MATERIALS USED THEREIN

Kazuhide Miyazaki, and Morimasa Sumida, both of Takehara, Japan, assignors to Mitsui Mining and Smelting Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 592,415, Mar. 23, 1984, abandoned. This application Jun. 7, 1985, Ser. No. 742,146
Claims priority, application Japan, Jun. 15, 1983, 58-105782
Int. Cl.[4] H01M *4/56*
U.S. Cl. 429—228 17 Claims



1. An active material for a lead-accumulator which consists of lead oxide as the principal component and at least one member selected from the group consisting of bismuth, bismuth compounds, thallium and thallium compounds as an additive, wherein the amount of bismuth or a bismuth compound is in the range of 0.001 to 0.03 wt % of the active material, expressed as net bismuth, the amount of thallium or thallium compound is up to 0.1 wt % of the active material, expressed as net thallium and the amount of both bismuth or a bismuth compound and thallium or a thallium compound is in the range of 0.001 to 0.03 wt % of the active material, expressed as net elements, the additive being incorporated in the lead oxide by preparing a bulk lead alloy which includes the addtive, and pulverizing the alloy, or by mixing a solution of a lead compound with a solution of the additive, and neutralizing the mixture of solutions to form precipitates.

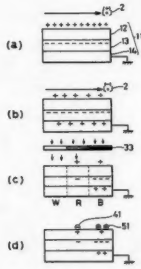
11. A lead-accumulator which comprises a battery container, positive electrodes in the form of grids, on which is deposited an active material consisting of lead oxide as the principal component and at least one member selected from the group consisting of bismuth, bismuth compounds, thallium and thallium compounds as an additive, negative electrodes, the positive electrodes and negative electrodes being alternately arranged with separators therebetween in the battery container, and dilute sulfuric acid filling the inner space of the battery container, wherein the amount of bismuth or a bismuth compound is in the range of 0.001 to 0.03 wt % of the active material, expressed as net bismuth, the amount of thallium or thallium compound is up to 0.1 wt % of the active material, expressed as net thallium and the amount of both bismuth or a bismuth compound and thallium or a thallium compound is in the range of 0.001 to 0.03 wt % of the active material, expressed as net elements, the additive being incorporated in the lead oxide by preparing a bulk lead alloy which includes the additive, and pulverizing the alloy, or by mixing a solution of a lead compound with a solution of the additive, and neutralizing the mixture of solutions to form precipitates.

4,594,302

DEVELOPING PROCESS FOR TWO-COLORED ELECTROPHOTOGRAPHY

Masahiko Kubo, Nara, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 29, 1985, Ser. No. 739,012
Claims priority, application Japan, May 31, 1984, 59-112331; May 31, 1984, 59-112332
Int. Cl.[4] G03G *13/01*
U.S. Cl. 430—42 **5 Claims**



1. A developing process for two-colored electrophotography comprising:

(1) charging the surface of a photoreceptor having a conductive substrate and two photosensitive layers successively formed on the conductive substrate, said photosensitive layers having different spectral sensitivities,

(2) charging the surface of said photoreceptor with a different polarity from the charging polarity in step (1),

(3) exposing a two-colored original to form electrostatic latent images, which have different polarities corresponding to the two-colored original, on the surface of said photoreceptor,

(4) transferring a first color toner charged with a different polarity from the charging polarity of one of the electrostatic latent images on said electrostatic latent image to develop said eletrostatic latent image with the first color toner,

(5) exposing the surface of said photoreceptor to eliminate electric charges with the same polarity as the first color toner which are induced on the surface of said photoreceptor in the vicinity of said electrostatic latent image developed by the first color toner, and

(6) transferring a second color toner charged with a different polarity from the charging polarity of the other electrostatic latent image on said other electrostatic latent image to develop said other electrostatic latent image with the second color toner.

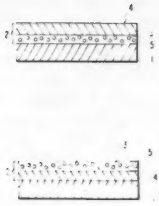
4,594,303

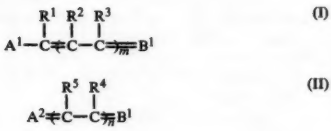
ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Seiji Horie, Saitama; Masayoshi Nagata, Kanagawa; Junji Nakano, and Hideo Sato, both of Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 628,135, Jul. 11, 1984, abandoned, which is a continuation of Ser. No. 398,488, Jul. 15, 1982, abandoned. This application Aug. 28, 1985, Ser. No. 769,779
Claims priority, application Japan, Jul. 15, 1981, 56-110423
Int. Cl.[4] G03G *5/06, 5/14*
U.S. Cl. 430—59 **22 Claims**

1. An electrophotographic photoreceptor which has an electrophotographic photoreceptive layer containing a charge generating material and a charge transporting material, said charge generating material being a compound of the following general formula (I) or (II):



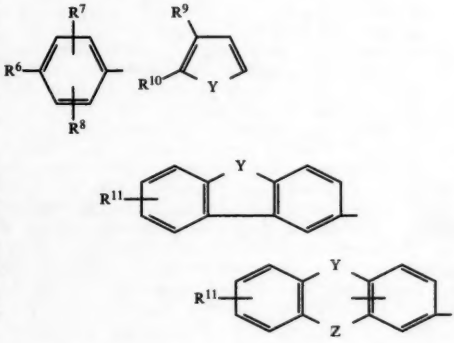


wherein:

(i) m is 0, and n is 0, 1, or 2,

(ii) R^1 to R^5 may be the same or different, and each is a hydrogen atom, an alkyl group, an aralkyl group, an aryl group or a monovalent group produced by removing one hydrogen atom from a heterocyclic ring,

(iii) A^1 is substituted phenyl group, a monovalent group produced by removing one hydrogen atom from a monocyclic 5-membered hetero-ring, a condensed 5-membered hetero-ring or a condensed 6-membered hetero-ring, which have the following structural formulae, respectively;



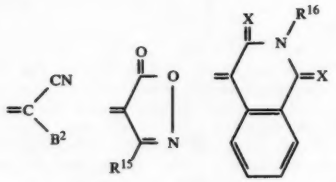
wherein R^6 is an alkoxy group, an aralkyloxy group or a substituted amino group of the formula

R^{12} and R^{13} each is a substituted or non-substituted alkyl group or a substituted or non-substituted phenyl group, or they may combine with each other and form a nitrogen-containing hetero-ring, and they may be the same or different; R^7 and R^8 may be the same or different, and each is a hydrogen atom, a halogen atom, an alkyl group or a lower alkoxy group; Y and Z are S, O or N—R^{14}, wherein R^{14} is an alkyl group having 1 to 4 carbon atoms, and they

may be the same or different; R^9 and R^{10} may be the same or different, and each is a hydrogen atom, an alkyl group or an alkoxy group, or they may combine with each other and form a benzene ring or a naphthalene ring; and R^{11} is a hydrogen atom, an alkyl group, an alkoxy group, an aryloxy group, an acyl group, an alkoxycarcarbonyl group, an aryloxycarbonyl group, a halogen atom, a monoalkylamino group, a dialkylamino group, an amido group or a nitro group, which groups each may be substituted;

(iv) A^2 is a divalent group produced by removing two hydrogen atoms attached to the same carbon from a heterocyclic ring selected from a group consisting of imidazoles, 3H-indoles, thiazoles, benzothiazoles, naphthothiazoles, thianaphtheno-7',6',4,5-thiazoles, oxazoles, benzoxazoles, naphthooxazoles, selenazoles, benzoselenazoles, naphthoselenazoles, thiazolines, quinolines, isoquinolines, benzimidazoles and pyridines, and

(v) B^1 is a divalent group selected from substituents of the following structural formulae;



wherein R^{15} and R^{16} each is an alkyl group or an aryl group; X is an oxygen atom or a sulfur atom; and B^2 is a cyano group, a carboxyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, an alkylsulfonyl group, an alkylcarbonyl group, an arylcarbonyl group, a nitro group, a nitro-substituted aryl group, a sulfo group, a trifluoromethylsulfonyl group, a carbamoyl group, an alkylcarbamoyl group, an arylcarbamoyl group or an acyl group whose carbonyl group is attached to a monovalent group produced by removing one hydrogen atom from a heterocyclic ring, and said charge transporting material is at least one compound selected from the group consisting of triphenylamine derivatives, polyarylalkane derivatives, pyrazoline derivatives and hydrazone derivatives.

3. The electrophotographic photoreceptor described in claim 1, wherein said electrophotographic photoreceptive layer is comprised of two layers, a first layer being a charge generating layer containing said charge generating material, and a second layer being a charge transporting layer containing said charge transporting material.

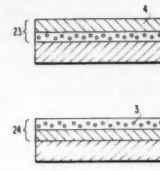
4,594,304

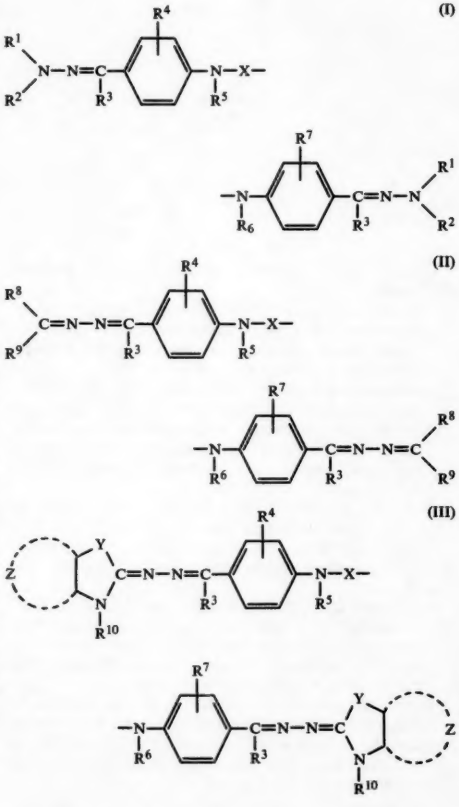
ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE HYDRAZONE MATERIAL

Shu Watarai, and Seiji Horie, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 5, 1985, Ser. No. 708,461
Claims priority, application Japan, Mar. 6, 1984, 59-42370
Int. Cl.[4] G03G *5/06, 5/14*
U.S. Cl. 430—59 **20 Claims**

1. An electrophotographic light-sensitive material comprising, provided on an electrically conductive support, a light-sensitive layer containing at least one hydrazone compound selected from the group consisting of compounds represented by formulae (I), (II), and (III) and a binder:





wherein

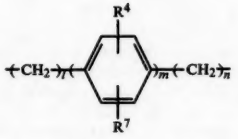
R^1 and R^2 each is an unsubstituted or substituted straight chain or branched chain alkyl group having from 1 to 12 carbon atoms, an unsubstituted or substituted straight chain or branched chain aralkyl group having from 7 to 20 carbon atoms, or a monovalent group formed by removing one hydrogen atom from a mononuclear or 2- to 4-nuclear condensed polycyclic aromatic hydrocarbon having from 6 to 20 carbon atoms, or R^1 and R^2 together form a heterocyclic ring,

R^3 is a hydrogen atom, an unsubstituted or substituted straight chain or branched chain alkyl group having from 1 to 12 carbon atoms, an unsubstituted or substituted aralkyl group having from 7 to 20 carbon atoms, or an unsubstituted or substituted aryl group having from 6 to 20 carbon atoms,

R^4 and R^7 each is a hydrogen atom, an unsubstituted or substituted straight chain or branched chain alkyl group having from 1 to 12 carbon atoms, an unsubstituted or substituted aralkyl group having from 7 to 20 carbon atoms, an unsubstituted or substituted aryl group having from 6 to 20 carbon atoms, a halogen atom, an alkoxy group having from 1 to 12 carbon atoms, or an aryloxy group having from 6 to 14 carbon atoms,

R^5, R^6, R^8, R^9, and R^{10} each is an unsubstituted or substituted straight chain or branched chain alkyl group having from 1 to 12 carbon atoms, an unsubstituted or substituted straight chain or branched chain aralkyl group having from 7 to 20 carbon atoms, or an unsubstituted or substituted aryl group having from 6 to 20 carbon atoms, or R^5 and R^6 together form an N-containing heterocyclic group, and

X is the formula



wherein l and n are each 0 or an integer of 1 to 6, m is 0 or 1, and $l+m+n>0$,

R^4 and R^7 each is the same substituent as described above for R^4 and R^7, or R^4 and R^7 together form a condensed polynuclear aromatic ring,

Y is an oxygen atom, a sulfur atom, a selenium atom, an unsubstituted or substituted imino group, or an unsubstituted or substituted methylene group, and

Z is an atomic group forming a benzene or naphthalene ring.

10. An electrophotographic light-sensitive material as in claim 1, wherein the light-sensitive material comprises of an electrically conductive support having thereon a light-sensitive layer comprising of an electric charge generating layer containing an electric charge generating substance and an electric charge trnasporting layer containing at least one of said hydrazone compounds.

4,594,305

LIQUID DEVELOPER AND CHARGE CONTROL SUBSTANCE SUITABLE THEREFOR

Hansjoerg Vollmann, Bad Soden, and Heinz Herrmann, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 12, 1985, Ser. No. 743,817

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 3422304

Int. Cl.[4] G03G *9/12*

U.S. Cl. 430—115 **9 Claims**

1. A liquid developer for developing positively charged electrostatic charge images, comprising:

an electrically insulating carrier liquid having a high resistance and a low dielectric constant and consisting of one or more aliphatic hydrocarbons;

pigments or dyes;

a resinous binder;

a charge control substance;

wherein said charge control substance is a negative-controlling graft copolymer soluble in an aliphatic hrdrocarbon and obtained by grafting a carboxylic acid N-alkenylamide onto polymers soluble in the aliphatic hydrocarbons of said carrier liquid.

4,594,306

LIGHT-SENSITIVE COPYING MATERIAL WITH O-QUINONE DIAZIDE AND PHENOLIC HYDROXY COMPOUND

Paul Stahlhofen, Wiesbaden, and Rainer Beutel, Flörsheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 151,543, May 20, 1980, abandoned, which is a continuation of Ser. No. 734,875, Oct. 22, 1976, abandoned. This application Aug. 17, 1984, Ser. No. 641,424

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1975, 2547905

Int. Cl.[4] G03C *1/60, 1/94;* G03F *7/08*

U.S. Cl. 430—166 **3 Claims**

1. A light-sensitive copying material comprising (A) an anodized aluminum support and (B) a positive-working, light-sensitive copying layer immediately adjacent to said support, said copying layer containing (i) an alkali-soluble resin, (ii) one selected from the group consisting of an o-quinone diazide sulfonic acid ester and an o-quinone diazide sulfonic acid amide; and (iii) at least one phenolic hydroxy compound selected from the group consisting of 8-hydroxy-quinoline, 2,3,4-trihydroxy-benzophenone and 1,2,4-trihydroxy-anthraquinone, said phenolic hydroxy compound being present in said copying layer in an amount between about 0.3 and 15 weight-percent, based on the weight of solid components in said copying layer.

4,594,307

COLOR THERMAL DIFFUSION-TRANSFER WITH LEUCO DYE REDUCING AGENT

Takuzo Ishida, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 25, 1985, Ser. No. 727,393

Int. Cl.[4] G03C *1/40, 5/54*

U.S. Cl. 430—203 **26 Claims**

1. A photothermographic composite structure for use in a solvent-free dye thermal diffusion-transfer process comprising:

(a) an image-receiving element comprising a polymeric dyeable image-receiving layer having a glass transition temperature in the range of 20° to 200° C., and

(b) strippably adhered to said image-receiving element, an imageable photothermographic element comprising in at least one layer thereof a binder, a silver source material, photosensitive silver halide in catalytic proximity to said silver source material, and a leuco base dye as the sole reducing agent present.

4,594,308

PHOTOGRAPHIC ELEMENT COMPRISING SULFINIC ACID/IMIDAZOLE POLYMER MORDANT

Taku Nakamura; Akira Hibino; Takeshi Shibata, and Koichi Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

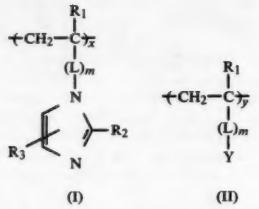
Filed Nov. 30, 1984, Ser. No. 676,987

Claims priority, application Japan, Nov. 30, 1983, 58-226497

Int. Cl.[4] G03C *1/40, 5/54*

U.S. Cl. 430—213 **16 Claims**

1. A photographic element, comprising: a support, at least one silver halide light-sensitive emulsion having associated therewith a dye-donating compound which is capable of imagewise forming a dye and an image-receiving layer containing as a mordant, a polymer comprising a monomer unit having at least an imidazole ring represented by the formula (I) and a monomer unit having at least a sulfinic acid group represented by the formula (II):



(I) (II)

wherein R_1, R_2 and R_3 each represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; L represents a divalent linking group having 1 to 20 carbon atoms; m represents 0 or 1; Y represents a sulfinic acid group or a sulfinic acid group in the form of a salt; x represents 10 to 98 mol%; and y represents 2 to 40 mol%; and wherein said mordant is a mordant for fixing dyes in a color formation process in which diffusible dyes are imagewise formed and then diffused, followed by fixing.

4,594,309

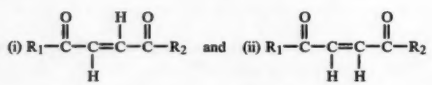
α,β DIKETONE CONTAINING POLYMERS AS POSITIVE PHOTORESIST COMPOSITIONS

James E. Guillet, Don Mills, Canada, assignor to Allied Corporation, Morris Township, N.J.

Filed Oct. 31, 1984, Ser. No. 666,864
Int. Cl.[4] G03C *1/495, 5/16;* **C08F** *16/36, 12/32*
U.S. Cl. 430—270 **19 Claims**

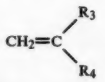
1. A composition of matter consisting essentially of a copolymeric material of:

(a) from about 0.1 to about 50 weight percent of a monomer selected from the group consisting of 1,4-disubstituted-2-butene-1,4-diones of the general structure



and mixtures of (i) and (ii) where R_1, R_2 are the same or different and are substituent selected from the group of 1 to 6 carbon atom allyl and halogen substitute alkyl radicals, aryl, halogen substituted aryl, alkyl substituted aryl, alkoxy substituted aryl, nitro substituted aryl, cyano substituted aryl and amino substituted aryl radicals, and benzyl, naphthyl and anthryl radicals with

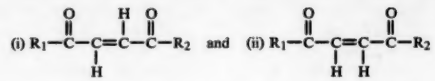
(b) at least one vinylidene monomer of general formula



where R_3 represents hydrogen, halogen or an alkyl group, and R_4 is a functional group selected from the group consisting of aryl, substituted aryl, carboxylic acid, lower alkyl carboxylate, lower alkyl, lower alkenyl, hydrogen, halogen, nitrile, lower acyloxy, lower alkoxy, amido and substituted amido provided, however, where either R_3 or R_4 is hydrogen, the other is not a phenyl radical.

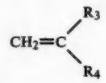
9. A positive photoresist solution comprising a photoresist copolymeric material which is sensitive to ultraviolet light range of:

(a) from about 0.1 to about 50 weight percent of a monomer selected from the group consisting of 1,4-disubstituted-2-butene-1,4-diones of the general structure



and mixtures of (i) and (ii) where R_1, R_2 are the same or different and are substituent selected from the group of 1 to 6 carbon atom allyl and halogen substitute alkyl radicals, aryl, halogen substituted aryl, alkyl substituted aryl, alkoxy substituted aryl, nitro substituted aryl, cyano substituted aryl and amino substituted aryl radicals, and benzyl, naphthyl and anthryl radicals with

(b) at least one vinylidene monomer of general formula



where R_3 represents hydrogen, halogen or an alkyl group, and R_4 is a functional group such as aryl, substituted aryl, carboxylic acid, lower alkyl carboxylate, lower alkyl, lower alkenyl, hydrogen, halogen, nitrile, lower acyloxy lower alkoxy, amido, or substituted amido provided, however, where either R_3 or R_4 is hydrogen, the other is not a phenyl radical and

(c) an organic solvent capable of solubilizing said copolymeric material.

4,594,310

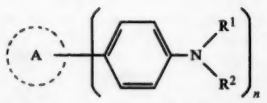
PHOTOPOLYMERIZABLE COMPOSITION COMPRISING TERTIARY AROMATIC AMINE AND HEXAARYLBIIMAZOLE INITIATORS

Hideki Nagasaka, Yamato, Japan, assignor to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,088
Claims priority, application Japan, Oct. 14, 1983, 58-192212
Int. Cl.[4] G03C *1/68;* **C08F** *2/46, 8/18*
U.S. Cl. 430—281 **5 Claims**

1. A photopolymerizable composition comprising an addition-polymerizable compound having at least one ethylenically unsaturated double bond and a photopolymerization initiator, characterized in that the said initiator comprises;

(a) a compound represented by the general formula:



(I)

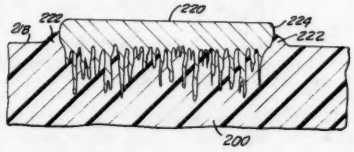
wherein R^1 and R^2 are an alkyl group, respectively, n is an integer of 1, 2 or 3 and ring A is an aromatic ring containing a nitrogen atom, and

(b) hexaarylbiimidazole.

4,594,311
PROCESS FOR THE PHOTOSELECTIVE METALLIZATION ON NON-CONDUCTIVE PLASTIC BASE MATERIALS

David C. Frisch, Baldwin, and Wilhelm Weber, Hicksville, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Oct. 29, 1984, Ser. No. 665,952
Int. Cl.[4] G03C 5/00
U.S. Cl. 430—315 45 Claims



1. In a process for preparing a metal pattern on a non-conducting substrate which includes the steps of:

treating one or more surfaces of a non-conductive substrate to render them hydrophilic and microporous by adhesion promotion, imaging a pattern corresponding to the desired metal pattern on the surfaces, said pattern being catalytic for electroless metal deposition, the improvement which comprises:

after said imaging step, exposing said surfaces to a first electroless metal plating step to initiate metal deposition to reinforce said catalytic pattern;

rendering the non-image surfaces of the substrate hydrophobic and resistant to metal deposition on exposure to an electroless metal deposition bath by contacting the substrate with a solvent composition comprised of a solvent in which the substrate is at least partially soluble for a time period sufficient to solvate the non-imaged surfaces of the substrate but insufficient to result in stress cracking or flow of the substrate onto the printed circuit pattern area, and

immediately drying the solvated surfaces of the base material at a temperature at which the solvent rapidly volatilizes to restore the hydrophobicity of the surfaces; and

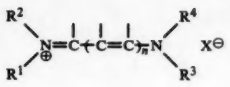
exposing the surfaces to a second electroless metal plating step to deposit metal on the reinforced catalytic pattern to form the metal pattern, the restored hydrophobicity of the non-image surface areas inhibiting metal deposition thereon.

4,594,312
HEAT BLEACHABLE DYE SYSTEMS

Gebran J. Sabongi, Woodbury, Minn.; Stephen S. C. Poon, Harlow, and Bernard A. Lea, London, both of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 6, 1984, Ser. No. 586,767
Claims priority, application United Kingdom, Mar. 15, 1983, 8307023
Int. Cl.[4] G03C 1/02, 1/72
U.S. Cl. 430—339 18 Claims

1. A photothermographic element comprising a support having on one surface thereof one or more layers constituting a photothermographic medium, the element further comprising an acutance/antihalation dye which is bleachable by heating in the absence of reactants characterized in that said acutance/antihalation dye is a bleachable dye of the formula:



(I)

in which:

n is 2, 3, 4 or 5,

at least one of R^1 to R^4 represent hydrogen and the remainder of R^1 to R^4 independently represent a hydrogen atom, an optionally substituted cycloalkyl group, an optionally substituted alkenyl group, an optionally substituted alkyl group, an optionally substituted aryl group, an optionally substituted heterocyclic aromatic group, or R^1 and R^2 together or R^3 or R^4 together represent the necessary atoms selected from C, N, O and S to complete a non-aromatic type ring,

$X^{\ominus}$ is an anion,

the free bonds of the polymethine chain being satisfied by hydrogen or any chain substituent of the type present in known cyanine dyes, said bleachable dye either being

(a) in reactive association with a mild reducing agent, or

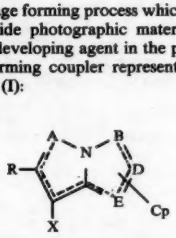
(b) present in the element in an environment free from reducing agent wherein the dye of formula (I) is present in an amount to provide a transmissive optical density to white light of from 0.05 to 0.8.

4,594,313
COLOR IMAGE FORMING PROCESS COMPRISING BLOCKED MAGENTA DYE FORMING COUPLER

Nobuo Furutachi, and Yoshinobu Yoshida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 12, 1985, Ser. No. 710,891
Claims priority, application Japan, Mar. 12, 1984, 59-46874
Int. Cl.[4] G03C 7/00, 1/08, 7/16, 7/32
U.S. Cl. 430—381 12 Claims

1. A color image forming process which comprises developing a silver halide photographic material using an armatic primary amino developing agent in the presence of a blocked magenta dye forming coupler represented by the following general formula (I):



(I)

wherein R represents a hydrogen atom or a substituent; X represents a hydrogen atom, a halogen atom, a carboxy group or a coupling releasable group; Cp represents a coupling block group capable of forming a colorless or alkali-soluble product by reaction with the oxidation product of a color developing agent; A represents

when Cp is bonded and —N= when Cp is not bonded; B and E each represents

when Cp is bonded and —N= or

when Cp is not bonded; D represents —N= or

(wherein R has the same significance as defined above and said Rs in said D and B and E may be the same or different); and represents three movable double bonds; said Cp is not, however, bonded to E when A, D and E simultaneously contain a nitrogen atom and B contains a carbon atom; said coupler may form a dimer or more oligomers at R or X; and said substituent Rs on adjacent carbon atoms may form a ring with each other.

4,594,314

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Toshihiko Kimura, Hachioji; Takashi Sasaki, Hino, and Yutaka Kaneko, Sagamihara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 526,882, Aug. 26, 1983, abandoned. This application Jul. 5, 1985, Ser. No. 752,003

Claims priority, application Japan, Aug. 30, 1982, 57-151135

Int. Cl.[4] G03C *1/46, 7/26*

U.S. Cl. 430—506 **21 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon one or more light-sensitive silver halide emulsion layers, wherein at least one of said light-sensitive silver halide emulsion layers contains a phenol-type cyan coupler having at the second position of the benzene nucleus thereof a group selected from the group consisting of a phenol-ureido group, a naphthyl ureido group and a heterocyclic ureido group, and having at the fifth position thereof an acylamino group, and at least one of said light-sensitive silver emulsion layers contains a naphthol-type cyan coupler which is substantially colorless and has a hydrogen atom or a group capable of splitting off a compound which does not inhibit the development of the coupling reaction at a coupling position with the oxidized product of an aromatic primary amine color developing agent,

wherein said phenol-type cyan coupler is incorporated into a lower-speed emulsion layer having a color sensitivity and said naphthol-type cyan coupler is incorporated into a higher-speed emulsion having the same color sensitivity.

4,594,315

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC ELEMENT WITH ELECTRON BEAM CURED INTERLAYER

Toshiaki Shibue, and Koichi Nagayasu, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,977

Claims priority, application Japan, Sep. 21, 1983, 58-174980; Sep. 22, 1983, 58-175885

Int. Cl.[4] G03C *1/76*

U.S. Cl. 430—531 **11 Claims**

1. A light-sensitive silver halide photographic element having (a) a cured coated layer on at least one surface of a support material, said cured coated layer having been formed by curing a composition with electron beam radiation, said composition prior to curing comprising (i) a compound having two or more unsaturated double bonds in its molecule which is curable by electron beam irradiation, (ii) an inorganic white pigment and (iii) a silane or a titanium coupling agent having two or more different reactive groups in its molecule, one of said reactive groups being chemically reactive with the inorganic white pigment to form a chemical bond therewith and said other reactive group being chemically reactive with said compound (i) to form a chemical bond therewith and (b) at least one layer of silver halide emulsion on said coated layer.

4,594,316

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL WITH REDUCIBLE PHOTOGRAPHICALLY USEFUL MOIETY RELEASER

Kiyoshi Morimoto; Keizo Furuya, and Masaharu Toriuchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

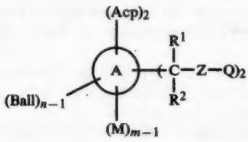
Filed Oct. 15, 1984, Ser. No. 660,838

Claims priority, application Japan, Oct. 13, 1983, 58-191243

Int. Cl.[4] G03C *1/40, 5/54, 1/42, 1/06*

U.S. Cl. 430—559 **16 Claims**

15. A silver halide photographic light-sensitive material comprising a support having provided thereon at least one light-sensitive silver halide emulsion layer associated with a substantially immobile, positive one-equivalent redox compound capable of releasing a photographically useful compound or a precursor thereof as a result of a redox reaction in an amount of from 1×10^{-4} to 1×10^{-2} mol/m^2, said compound being represented by formula (I):



(I)

wherein Acp are located in the para position and represents an oxo group; R^1 and R^2 each represents a hydrogen atom, a substituted or unsubstituted straight or branched chain or cyclic alkyl group having about 1 to about 40 carbon atoms, or a substituted or unsubstituted aryl group having form 6 to 30 carbon atoms; Z represents

or —O—; Q represents a group capable of becoming a photographically useful compound or a precursor thereof when released wherein the photographically useful compound is a diffusible dye, an antifoggant, a developing agent, a hardener, a solvent for silver halide, a development accelerator, or a fixing agent, provided that Q does not contain an atom or atomic group which functions as an electrophilic center that induces an intramolecular substitution reaction; Ball represents a substituted or unsubstituted alkyl group having from 1 to 40 carbon atoms or a substituted or unsubstituted aryl group; M represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a halogen atom, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted acyl group, a substituted or unsubstituted acylamino group, a substituted or unsubstituted sulfamoyl group or a substituted or unsubstituted carbamoyl group; represents an organic group which connects Acp,

M, and Ball and is an organic group derived from a 1,4 ben-

zohydroquinone compound; and n and m each represents an integer of 1 or more.

4,594,317

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Noboru Sasaki; Shunichi Aida, and Tadashi Ikeda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

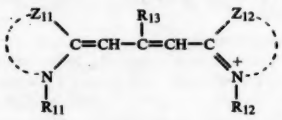
Filed Dec. 14, 1984, Ser. No. 681,743

Claims priority, application Japan, Dec. 15, 1983, 58-237067

Int. Cl.[4] G03C *1/02*

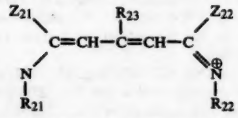
U.S. Cl. 430—574 **17 Claims**

1. A silver halide photographic light-sensitive material comprising a support and at least one silver halide emulsion layer, wherein at least about 50% of the total projected surface area of silver halide grains contained in said silver halide emulsion layer comprises tabular silver halide grains having a mean aspect ratio of at least about 5:1 and said emulsion layer contains a sensitizing dye represented by the following general formula (Ib), a sensitizing dye represented by the following general formula (IIb) and a sensitizing dye represented by the following general formula (IIIb):



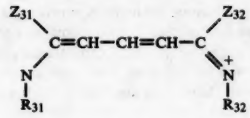
(Ib)

wherein R_{11} and R_{12}, which may be the same or different, each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group or a substituted or unsubstituted aralkyl group; R_{13} represents a hydrogen atom, an aryl group or an alkyl group having 1 to 4 carbon atoms; and Z_{11} and Z_{12}, which may be the same or different, each represents a substituted or unsubstituted atomic group necessary to form an oxazole ring, a benzoxazole ring or a naphthoxazole ring together with the adjacent N and N^{30}, respectively, at least one of R_{11} and R_{12} being an alkyl group substituted with a carboxyl group or a sulfo group;



(IIb)

wherein R_{21} and R_{22}, which may be the same or different, each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group or a substituted or unsubstituted aralkyl group; R_{23} represents a hydrogen atom, an aryl group or an alkyl group having 1 to 4 carbon atoms; Z_{21} represents a substituted or unsubstituted atomic group necessary to form an oxazole ring, a benzoxazole ring or a naphthoxazole ring together with N; and Z_{22} represents a substituted or unsubstituted atomic group necessary to form a benzothiazole ring, a thiazole ring, a naphthothiazole ring, a selenazole ring, a benzoselenazole ring or a naphthoselenazole ring together with N^+, at least one of R_{21} and R_{22} being an alkyl group substituted with a carboxyl group or a sulfo group; and



(IIIb)

wherein R_{31} and R_{32}, which may be the same or different, each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group or a substituted or unsubstituted aralkyl group; Z_{31} represents a substituted or unsubstituted atomic group necessary to form an oxazole ring, a benzoxazole ring or a naphthoxazole ring together with N; and Z_{32} represents a substituted or unsubstituted atomic group necessary to form a benzimidazole ring or a naphthoxazole ring together with N^+, at least one of R_{31} and R_{32} being an alkyl group substituted with a carboxyl group or a sulfo group.

4,594,318

ISOLATION AND LOCALIZATION OF DNA SEGMENTS

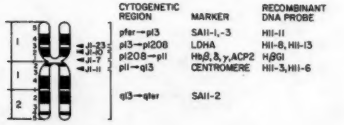
James F. Gusella, Framingham; David Housman, Watertown; Cheryl Keys, Worcester, all of Mass.; Aviva Varsanyi-Breiner, Ness-Ziona, Israel; Theodore T. Puck, Denver, Colo.; Carol Jones, Denver, Colo., and Fa-Ten Kao, Denver, Colo., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

PCT No. PCT/US81/00576, § 371 Date May 17, 1982, § 102(e) Date May 17, 1982

PCT Filed Apr. 29, 1981, Ser. No. 403,771

Int. Cl.[4] C12Q *1/68*; C12N *15/00*; C12P *19/34*

U.S. Cl. 435—6 **1 Claim**



1. A process for the isolation of human repetitive DNA fragments comprising:

(a) isolating 15 to 20 kilobase human DNA fragments;

(b) inserting the human DNA fragments of step a into the DNA of lambda bacteriophage to form a clone;

(c) screening the ligated phage DNA for clones containing human DNA;

(d) isolating the DNA from the clones of step c containing human DNA;

(e) fragmenting the isolated DNA of step d;

(f) resolving the fragments of step e;

(g) hybridizing the resolved fragments of step f with human DNA using molecular hybridizing conditions which only identify fragments with human repetitive DNA sequences, wherein said repetitive DNA fragments are isolated from and are unique to human chromosomes.

4,594,319

PROTEIN KINASE ENZYME AUT-PK 500 AND A RADIOIMMUNOASSAY FOR DETECTION OF NEOPLASIA

Rameshwar K. Sharma, Memphis, Tenn., assignor to The University of Tennessee Research Corp., Knoxville, Tenn.

Filed Mar. 19, 1984, Ser. No. 590,712

Int. Cl.[4] C12Q *1/00*; G01N *33/54*; C12N *9/12*; C07G *7/00*

U.S. Cl. 435—7 **22 Claims**

1. The substantially purified enzyme, autophosphorylating protein kinase, AUT-PK 500, free from other tissue culture components, and having the physical characteristics:

(a) molecular weight as determined by sucrose density sedimentation—490,000;

(b) molecular weight as determined by ultracentrifuge—481,400 (±7%);

(c) asymmetric molecular configuration;

(d) frictional coefficient—1.28;

(e) sedimentation coefficient—18.20;

(f) Stokes radius—66 angstroms;

(g) optimum activity pH—7.5;

(h) pI—4.6;

(i) phosphate bond—acid stable and alkali labile;
(j) autophosphorylates serine residues but not threonine;
(k) activity unaffected by polyarginine;
(l) autophosphorylation activated by the divalent cations Mg^{2+}, Mn^{2+}, Sr^{2+}, Co^{2+} or Ca^{2+}.

6. A diagnostic immunoassay method for detecting the presence of mammalian neoplasia which comprises contacting a substance to be tested for neoplasia with an antibody which specifically binds to one or more antigenic determinants of the enzyme AUT-PK 500 and measuring materials bound by said antibody.

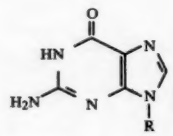
4,594,320

PROCESS FOR PRODUCING 3-DEOXYGUANOSINE

Tetsuro Fujishima, Choshi, Japan, assignor to Yamasa Shoyu Kabushiki Kaisha, Choshi, Japan

Filed Mar. 29, 1983, Ser. No. 479,980
Claims priority, application Japan, Nov. 4, 1982, 57-194394
Int. Cl.[4] C12R *1/265, 1/445, 1/45, 1/64;* **C12P** *19/30, 19/38, 19/40;* **C12N** *9/12*
U.S. Cl. 435—89 **6 Claims**

1. A process for producing 3'-deoxyguanosine, which comprises reacting a guanine derivative represented by the formula:



wherein R is selected from the group consisting of a hydrogen atom, a ribose-1-ly group, a 2-deoxyribose-1-yl group and a monophosphate, a diphosphate or a triphosphate thereof with a 3-deoxyribose donor at a reaction temperature of 40° to 75° C. and at a pH of 5.0 to 9.0, said reaction being carried out in the presence of a nucleoside phosphorylase source in the presence of a phosphoric acid ion donor, which source is capable of providing 3'-deoxyguanosine by the reaction of the guanine derivative with the 3-deoxyribose donor in the presence of a phosphoric acid ion donor and which nucleoside phosphorylase source is derived from a microorganism which belongs to a genus Xanthomonas, Micrococcus, Staphylococcusus or Sarcina to obtain 3'-deoxyguanosine.

4,594,321

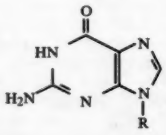
PROCESS FOR PRODUCING 3-DEOXYGUANOSINE

Tetsuro Fujishima, and Shinji Sakata, both of Choshi, Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Choshi, Japan

Filed Mar. 29, 1983, Ser. No. 479,979
Claims priority, application Japan, Apr. 1, 1982, 57-55078
Int. Cl.[4] C12P *19/30, 19/38, 19/40;* **C12N** *9/12*
U.S. Cl. 435—89 **13 Claims**

1. A process for producing 3'-deoxyguanosine, which comprises reacting a guanine derivative represented by the formula:

[I]



wherein R is selected from the group consisting of a hydrogen atom, a ribose-1-ly group, a 2-deoxyribose-1-yl group and a monophosphate, a diphosphate or a triphosphate thereof with a 3-deoxyribose donor at a reaction temperature of 40 to 75 C. and at a pH of 5.0 to 9.0, in the presence of a nucleoside phosphorylase source in the presence of a phosphoric acid ion donor, which source is capable of providing 3'-deoxyguanosine by the reaction of the guanine derivative with the 3-deoxyribose donor in the presence of a phosphoric acid ion donor to obtain 3-deoxyguanosine, said nucleoside phosphorylase source being derived from a microorganism which belongs to the genus Pseudomonas, Brevibacterium, or Achromobacter.

4,594,322

GLUCOSE OR MALTOSE FROM STARCH

Gregory J. Thompson, Waukegan; Kaung-Far Lin, Arlington Heights, and David W. Penner, Hoffman Estates, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 486,479, Apr. 19, 1983, abandoned. This application May 10, 1984, Ser. No. 608,837
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.[4] C12P *19/22, 19/24, 19/20, 7/14*
U.S. Cl. 435—95 **11 Claims**

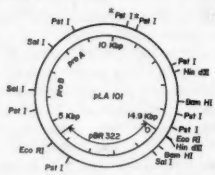
1. A process for obtaining a sugar which is either glucose or maltose from thinned starch comprising hydrolyzing a feedstock of thinned starch under the action of a glucose- or maltose-producing enzyme to a product containing from about 50% to 92% of said sugar, separating the product into a sugar-enriched stream, containing at least 90% sugar, and a sugar-depleted stream, recovering the sugar-enriched stream, and recycling the sugar-depleted stream to a hydrolysis zone.

4,594,323

HYBRID DNA CONFERRING OSMOTIC TOLERANCE

Laszlo N. Csonka, and Raymond C. Valentine, both of Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 421,666, Sep. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 259,318, Apr. 30, 1981, abandoned. This application Jan. 12, 1984, Ser. No. 570,410
Int. Cl.[4] C12P *13/24;* **C12N** *15/00, 1/20;* **C07H** *19/10*
U.S. Cl. 435—107 **14 Claims**



12. An extrachromosomal element comprising a non-conjugative vector capable of stable replication in a preselected host and a DNA sequence joined to the vector, said DNA sequence capable of expressing at least two enzymes in the biosynthetic pathway from 2-ketoglutarate to L-proline and conferring osmotic tolerance on a compatible host.

14. An extrachromosomal element as in claim 12, wherein the DNA sequence is inserted into the EcoRI site of pBR322.

4,594,324

MICROBIOLOGICAL PROCESS FOR OXIDIZING ORGANIC COMPOUNDS

Howard Dalton, Leamington Spa; John Colby, Burbage, both of England, and David I. Stirling, Rutherglen, Scotland, assignors to National Research Development Corp., London, England

Continuation of Ser. No. 296,361, Aug. 26, 1981, abandoned, which is a continuation of Ser. No. 157,169, Jun. 6, 1980, abandoned, which is a continuation of Ser. No. 921,610, Jul. 3, 1978, abandoned. This application Dec. 28, 1982, Ser. No. 453,825

Claims priority, application United Kingdom, Jul. 4, 1977, 27886/77; May 25, 1978, 27886/77

Int. Cl.[4] **C12P** *17/02, 17/12, 7/26, 7/02, 7/22, 7/04, 7/16;* **C12R** *1/01, 1/26*

U.S. Cl. 435—123 **14 Claims**

1. A process for oxidizing an alkene comprising:

contacting said alkene with a culture of methane-oxidizing *Methylococcus capsulatus* (Bath) bacteria or an extract of said culture which contains a methane-oxidizing enzyme system under conditions of medium and temperature, and for a period of time required for, oxidation of said alkene.

2. A process for oxidizing propene comprising:

contacting said propene with a culture of methane-oxidizing bacteria selected from the group consisting of *Methylmonas albus* (BG8), *Methylmonas agile* (A20), *Methylcystis parvum* (OBBP), *Methylosinus trichosporium* (OB3b), *Methylomonas methanica* (PM) and mixtures thereof or an extract of said culture which contains a methane-oxidizing enzyme system under conditions of medium and temperature, and for a period of time required for, oxidation of said propene.

4,594,325

HIGH FUSION FREQUENCY FUSIBLE LYMPHOBLASTOID CELL LINE

Robert L. Lundak, Riverside, Calif., assignor to The Regents of the University of Calif., Berkeley, Calif.

Filed Mar. 26, 1981, Ser. No. 247,656

Int. Cl.[4] **C12N** *5/00, 15/00;* **C12R** *1/91*

U.S. Cl. 435—240 **2 Claims**

1. An immortal B-cell line WI-L2-729HF_2.

4,594,326

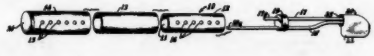
TIME-INTEGRATED MEASUREMENT FOR DETERMINING SUBSTANCES IN BIOLOGICAL FLUIDS

Stephen E. Wade, 3611 Guion Rd., Apt. D, Indianapolis, Ind. 46222

Filed May 9, 1983, Ser. No. 492,705

Int. Cl.[4] **G01N** *33/50*

U.S. Cl. 436—501 **9 Claims**



1. A method for determining the time integrals of the concentrations of chemical substances in a biological fluid, comprising:

the step of exposing a composition, which is capable of binding the said chemical substances of interest to itself, to the biological fluid,

said step of exposing being such that there is maintained a diffusion pathway of known and constant permittivity with respect to the chemical substances of interest for the duration of the measurement interval,

this same diffusion pathway being such as to have negligible permittivity for the binding composition,

said step of exposing also being such that the concentrations of those fractions of the chemical substances of interest which have traversed the diffusion pathway from the biological fluid to the binding composition, but which remain unbound by said binding composition, remain negligible relative to the concentrations of the chemical substances of interest available in the biological fluid for diffusion through said pathway,

the method further comprising the step of quantitatively determining the amounts of the chemical substances of interest which have traversed the diffusion pathway during the interval of the exposure, the amounts of the chemical substances of interest traversing the diffusion pathway during the interval of the exposure thereby being proportional to the time integral of the concentrations of said substances in the biological fluid during said interval.

4,594,327

ASSAY METHOD FOR WHOLE BLOOD SAMPLES

Robert F. Zuk, Menlo Park, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 2, 1983, Ser. No. 548,165

Int. Cl.[4] **G01N** *33/53, 33/544, 33/557, 33/558*

U.S. Cl. 436—514 **11 Claims**

9. A method for detecting the presence of a member of a specific binding pair ("sbp member") in a whole blood sample, said sbp member selected from the group consisting of ligand and homologous receptor, where said method involves (1) a binding agent for red blood cells in said sample; (2) a solid bibulous element to which is bound at least one sbp member; and (3) a signal producing system capable of producing a detectable signal, the members of which include at least one label which is bound to an sbp member, said method comprising:

(a) combining in an aqueous medium a whole blood sample, a binding agent for aggregating red blood cells in said sample, and fewer than all the members of the signal producing system,

(b) contacting a portion of said bibulous carrier with said aqueous medium to allow said medium to diffuse along said bibulous element and said aggregated red blood cells to concentrate in an area on said element adjacent the air/liquid interface,

(c) contacting said bibulous element with any remaining members of the signal producing system, and

(d) detecting the signal as a result of said signal producing system, wherein said signal is related to the amount of said sbp member in said sample.

4,594,328

TISSUE PROTEIN PP_{21}, A PROCESS FOR OBTAINING IT AND ITS USE

Hans Bohn, Marburg, and Wilhelm Winckler, Wenkbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,495

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410694

Int. Cl.[4] **C07K** *15/14;* **A61K** *35/42, 35/50, 39/395*

U.S. Cl. 436—543 **12 Claims**

1. A protein PP_{21}, extracted from a source of said protein and having the following characteristics:

(a) an electrophoretic mobility in the region of that of β_1-globulins;

(b) an isoelectric point of 4.6±0.3;

(c) a sedimentation coefficient $s_{20,w}$ of 3.2±0.2 S;

(d) a molecular weight determined in an ultracentrifuge of 52,900±6,200;

(e) an extinction coefficient $E_{1cm}{}^{1\%}$(280 nm) of 10.5±1.0;

(f) a carbohydrate fraction of 19.2±5.2 g/100 g (mannose 1.8±0.4, galactose 4.3±1.0, fucose 1.3±0.3, N-acetylglucosamine 6.5±2.0 and N-acetylneuraminic acid 5.3±1.5, each g/100 g); and

(g) an amino acid composition as in the following table:

Amino acid	Residues per 100 residues	Coefficient of variation
lysine	8.75	3.91
histidine	1.58	6.81
arginine	2.75	6.07
aspartic acid	9.59	1.97
threonine	3.73	7.22
serine	7.43	5.95
glutamic acid	8.16	5.15
proline	11.34	9.36
glycine	7.01	1.25
alanine	4.98	3.62
cystine ½	5.50	0.84
valine	8.14	1.42
methionine	0.00	0.00
isoleucine	4.86	2.78
leucine	5.42	10.34
tyrosine	5.01	5.01
phenylalanine	3.56	1.00
tryptophan	2.12	17.65

4,594,329

CRF ANALOGS

Wylie W. Vale, Jr., and Jean E. F. Rivier, both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed May 14, 1984, Ser. No. 610,110

Int. Cl.[4] C07K *7/00;* **A61K** *37/02;* **G01N** *33/54*

U.S. Cl. 514—12 **20 Claims**

1. A composition for lowering the blood pressure of mammals comprising an effective amount of a synthetic CRF peptide or a nontoxic addition salt thereof having the sequence: R_1-R_2-R_3-R_4-R_5-Ile-Ser-R_8-R_9-leu-R_{11}-R_{12}-R_{13}-leu-leu-Arg-R_{17}-R_{18}-R_{19}-Glu-R_{21}-R_{22}-R_{23}-R_{24}-R_{25}-R_{26}-R_{27}-R_{28}-R_{29}-Gln-ala-R_{32}-R_{33}-Asn-Arg-R_{36}-R_{37}-R_{38}-R_{39}-R_{40}-R_{41}

wherein R_1 is Ser, D-Ser or des R_1; R_2 is Gln, pGlu, Glu, D-pGlu or des R_2; R_3 is Glu, Gly, D-Tyr or des R_3; R_4 is Pro, D-Pro or des R_4; R_5 is Pro or desR_5; R_8, R_{12}, R_{19} and R_{24} are selected from the group consisting of leu, Ile, ala, Gly, Val, Nle, Phe and Gln; R_9 is Asp or Glu; R_{11} is Thr or Ser; R_{13} is His, Tyr or Glu; R_{17} is Glu or Lys; R_{18} is Val, Nle or Met; R_{21} is Met, Nva, Ile, ala, leu, Nle, Val, Phe or Gln; R_{22} is ala, Thr, Asp or Glu; R_{23} is Arg, Orn, Har or Lys; R_{25} is Asp or Glu; R_{26} is Gln, Asn or Lys; R_{27} is leu, Ile, ala, Val, Nva, Met, Nle, Phe, Asp, Asn, Gln or Glu; R_{28} is ala, Arg or Lys; R_{29} is Gln or Glu, R_{32} is His, Gly, Tyr or ala; R_{33} is Ser, Asn, leu, Thr or ala; R_{36} is Lys, Orn, Arg, Har or Leu; R_{37} is leu or Tyr; R_{38} is Met or leu; R_{39} is Glu or Asp; R_{40} is Ile, Thr, Glu, ala, Val, leu, Nle, Phe, Nva, Gly or Gln; R_{41} is ala, Ile, Gly, Val, Leu, Nle, Phe, Gln or des R_{41}, provided however that R_3 is D-Tyr or R_4 is D-Pro or R_{28} is Arg or R_{29} is Glu- or R_{40} is Glu or R_{36} is either Arg oor Har or R_{37} is Tyr, wherein leu is L-leucine or CαCH$_3$-L-leucine (CML) and ala is L-alanine or CαCH$_3$-L-alanine (CMA); and a pharmaceutically or veterinarily acceptable liquid or solid carrier therefor.

4,594,330

FINE AMORPHOUS POWDER AND PROCESS FOR PREPARING FINE POWDERY MIXTURE OF SILICON NITRIDE AND SILICON CARBIDE

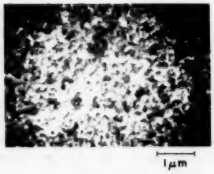
Takashi Suzuki; Takamasa Kawakami; Takeshi Koyama, all of Niigata; Masami Orisaku, Matsudo; Kansei Izaki, Niigata; Rieko Nakano, Niigata, and Akira Mori, Niigata, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,036

Claims priority, application Japan, Mar. 22, 1984, 59-55172; Mar. 22, 1984, 59-55173; Apr. 18, 1984, 59-77790; May 8, 1984, 59-91353; Nov. 12, 1984, 59-238034

Int. Cl.[4] C04B *35/52*

U.S. Cl. 501—92 **16 Claims**



1. Fine, spherical, substanitally halogen-free and oxygen-free amorphous powder having the general formula:

SiCxNyHz

wherein $0.1<x<2.0$, $0.1<y<1.5$ and $0<z<4$.

4,594,331

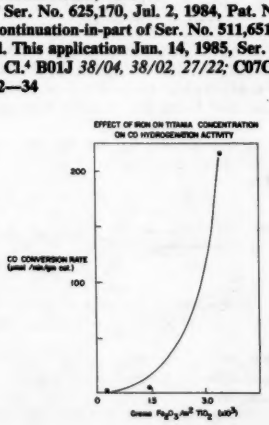
IMPROVING ACTIVITY OF IRON CARBIDE AND ILMENITE ON TITANIA FISCHER-TROPSCH CATALYST

Rocco A. Fiato, Scotch Plains, and Edwin L. Kugler, Glen Gardner, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 625,170, Jul. 2, 1984, Pat. No. 4,548,953, which is a continuation-in-part of Ser. No. 511,651, Jul. 7, 1983, abandoned. This application Jun. 14, 1985, Ser. No. 744,750

Int. Cl.[4] B01J *38/04, 38/02, 27/22;* **C07C** *1/04*

U.S. Cl. 502—34 **4 Claims**



1. A process for improving the activity of a Fischer-Tropsch catalyst present in a Fischer-Tropsch reaction zone wherein said catalyst comprises a mixture of iron carbide and ilmenite supported on a titania support wherein the amount of iron present in said supported iron carbide and ilmenite mixture, calculated as Fe_2O_3, is at least about 2×10^{-3} grams per square meter of titania support surface and wherein said reaction zone

contains a Fischer-Tropsch feedstream comprising a mixture of H_2 and CO, said process comprising reducing or eliminating the hydrogen content of the Fischer-Tropsch feedstream, raising the temperature in said reactor between about 50° to about 150° C. above the Fisher-Tropsch reaction temperature for from about 1 to 6 hours and then lowering the temperature back to the reaction temperature and reestablishing the hydrogen content of the feedstream.

2. The process of claim 1 wherein said catalyst contains one or more alkali metal promoters present on the catalyst in an amount of about 0.5 to 5 wt.% based on the amount of iron present as iron carbide and ilmenite, calculated at Fe_2O_3, present on said catalyst.

3. The process of either of claims 1 or 2 wherein the amount of iron present in said supported iron carbide and ilmenite mixture, calculated as Fe_2O_3, ranges between about 2 to 25 milligrams per square meter of titania support surface.

4,594,332

PREPARATION OF HARD, FRACTURE-RESISTANT CATALYSTS FROM ZEOLITE POWDER

Wolfgang Hoelderich, Frankenthal; Lothar Riekert, Karlsruhe; Michael Kotter, Bruchsal, and Ulrich Hammon, Karlsruhe, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 543,536, Oct. 20, 1983, abandoned.
This application Aug. 2, 1985, Ser. No. 762,026
Int. Cl.[4] B01J *29/28*
U.S. Cl. 502—64 **6 Claims**

1. A process for the preparation of a hard, fracture-resistant zeolite catalyst of the pentasil family, wherein water, hydroxyethylcellulose and a silicate are added to the zeolite powder, and the material is molded, dried and calcined.

3. A process for the preparation of a zeolite catalyst as claimed in claim 1, wherein molding is carried out by kneading the material and then extruding it.

4. A process as claimed in claim 3, wherein the extrudates are dried and then impregnated with a solution of 2.5% of tetramethyl orthosilicate in carbon tetrachloride.

4,594,333

ZEOLITE MODIFICATION

Clarence D. Chang, Princeton, and Cynthia T. W. Chu, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 31, 1984, Ser. No. 646,200
Int. Cl.[4] B01J *29/28*
U.S. Cl. 502—71 **18 Claims**

1. A method for modifying a composition to increase its acid catalytic activity, said composition comprising a physical mixture of a zeolite and a solid source of aluminum, said zeolite having a silica to alumina ratio of at least 12, and a Constraint Index of about 1 to 12, which method comprises:

contacting said mixture with an aqueous solution containing an activating amount of an alkali metal compound selected from the group consisting of an alkali metal hydroxide, an alkali metal salt of a weak acid having a dissociation constant less than about 10^{-3}, and mixtures thereof, and an activation-promoting amount of an alkali metal salt of a strong mineral acid, under a combination of conditions including a temperature up to about 370° C. for less than about 1 hour to about 100 hours, said combination of conditions being effective to induce said increased activity.

3. The method described in claim 1 wherein said solid source of aluminum is present as binder for said zeolite.

4. The method described in claim 3 wherein said alkali metal is lithium, sodium or potassium, said weak acid is acetic, carbonic or phosphoric, said temperature is 10° C. to 200° C., and said aqueous solution is adjusted to a pH of 7 to about 12 before said contacting step.

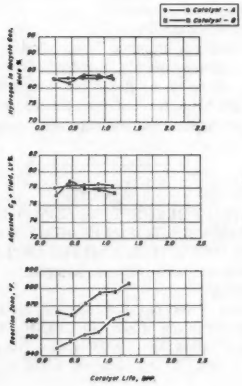
6. The method described in claim 4 wherein said zeolite is ZSM-5 having a silica to alumina ratio of at least about 10.

4,594,334

PLATINUM-, RHENIUM-, INDIUM-CONTAINING CATALYSTS FOR CONVERSION OF HYDROCARBONS

George J. Antos, Bartlett, and Li Wang, Westmont, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 19, 1985, Ser. No. 703,071
Int. Cl.[4] B01J *27/045, 27/125, 27/13;* **C10G** *35/06*
U.S. Cl. 502—223 **14 Claims**



1. A catalytic composite comprising:

(a) a refractory inorganic oxide selected from the group consisting of silica, alumina, silica-alumina, and crystalline alumina silicates;

(b) a first uniform dispersion of about 0.01 to about 5.0 wt. %, on the weight of the composite, of platinum and about 0.01 to about 5.0 wt. %, on the weight of the composite of rhenium;

(c) a second dispersion of about 0.01 to about 5.0 wt. %, on the weight of the composite, of indium thereover;

(d) about 0.1 to about 10 wt. %, on the weight of the composite, of halogen; and

(e) about 0.01 to about 10.0 wt. %, on the weight of the composite, of sulfur.

6. A method of preparing a catalytic composite comprising compositing a refractory oxide selected from the group consisting of silica, alumina, silica-alumina, and crystalline alumina silicates, with a first uniform dispersion of about 0.01 to about 5.0 wt. % of platinum, and about 0.01 to about 5.0 wt. % of rhenium, a second dispersion of about 0.01 to about 5.0 wt. % of indium thereover, about 0.1 to about 10 wt. % of halogen, and about 0.01 to about 10 wt. % sulfur, with all proportions based on the weight of the composite.

9. The method of claim 6, further characterized in that the alumina support is composited with the uniform dispersion of platinum and rhenium by an impregnation step followed by oxidation of the resulting impregnated composite and a subsequent halogen adjustment step.

4,594,335

TRANSITION METAL ALUMINATES

John L. Burba, III, and Richard A. Wolcott, both of Angleton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 11, 1984, Ser. No. 609,381
Int. Cl.[4] B01J *23/32, 23/70, 31/00, 27/14*
U.S. Cl. 502—324 24 Claims

1. In a method for preparing a compound comforming substantially to the empirical formula

$MA_aZ_b.nAl(OH)_3.mH_2O$

where M represents at least one divalent transition metal selected from the group comprising Cu, Zn, Mn, Fe, Co, and Ni,

where A and Z represent anions or negative-valence radicals of mono-, di- , or polyvalences, v represents the valence, a is an amount in the range of 0–2, b is an amount in the range of 0–2, with (va)+(vb) equal to 2 to satisfy the valence requirements of divalent M,

where n represents a numerical value such that the ratio of Al/M is at least 1/1, and

where m represents a numerical value for waters of hydration of zero or greater,

said process comprising

reacting hydrous alumina, in an alkaline aqueous carrier, with a transition metal compound of the empirical formula MAZ, where M, A, and Z are as described above,

said process being further characterized by performing said reaction at elevated temperature, using crystalline hydrous alumina.

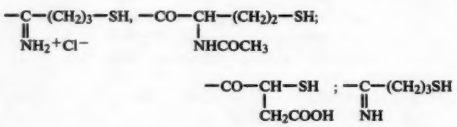
4,594,336

THIOLATED POLYPEPTIDE COMPOUND DERIVED FROM A TETANUS TOXIN FRAGMENT, THE PROCESS FOR OBTAINING AND ITS APPLICATION

Bernard Bizzini, Paris, France, assignor to Institut Pasteur, Paris, France

Continuation of Ser. No. 425,543, Sep. 28, 1982, abandoned, which is a continuation of Ser. No. 210,810, Nov. 26, 1980. This application Apr. 19, 1984, Ser. No. 601,745
Int. Cl.[4] A61K *37/00;* C07K *15/04*
U.S. Cl. 514—2 7 Claims

1. A thiolated compound consisting of the B-II_b fragment of tetanus toxin to which is covalently bound at least one Z—SH, wherein Z is the residue of a thiolation agent, said Z—SH having a formula chosen from the group consisting of:



said compound being capable of being transported retrogradely along axons and to bind to the same receptors as tetanus toxin.

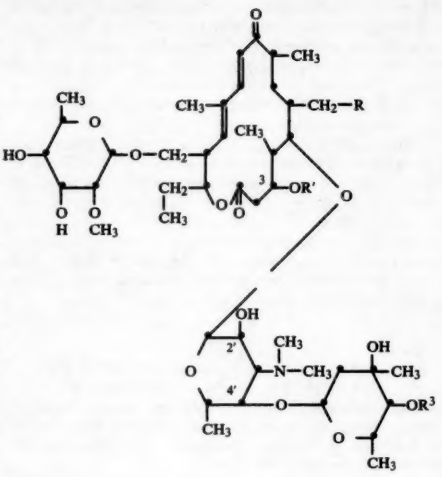
4,594,337

METHODS OF CONTROLLING MYCOPLASMA INFECTIONS

Earl E. Ose, Greenfield, and Jan R. Turner, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 471,630, Mar. 3, 1983, abandoned. This application Feb. 27, 1985, Ser. No. 705,953
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—30 12 Claims

1. a method for controlling Mycoplasma infections which comprises administering to a warm-blooded animal a composition comprising an amount effective to control Mycoplasma infections of a compound of the formula



wherein

R is formyl or hydroxymethyl;

R^1 is hydrogen, acetyl or propionyl; and R^3 is hydrogen, acetyl, propionyl, n-butyryl or isovaleryl; provided that one of R^1 or R^3 must be other than hydrogen; or a pharmaceutically acceptable acid addition salt thereof; together with a suitable pharmaceutical vehicle.

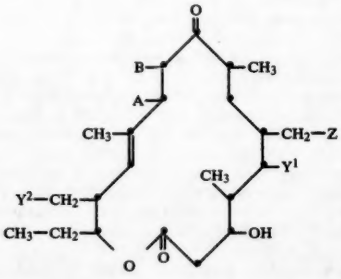
4,594,338

THIOETHER DERIVATIVES OF TYLOSIN

Satoshi Omura, 12-7 Seta 5-Chome, Setagaya-ku, Tokyo, and Kazuo Tsuzuki, 18-22, Nishi-Azabu 4-Chome, Minato-ku, Tokyo, both of Japan

Filed Feb. 19, 1985, Ser. No. 702,533
Claims priority, application United Kingdom, Feb. 27, 1984, 8405087
Int. Cl.[4] A61K *31/70;* C07H *17/08*
U.S. Cl. 514—30 12 Claims

1. A compound of formula (I):

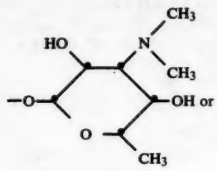


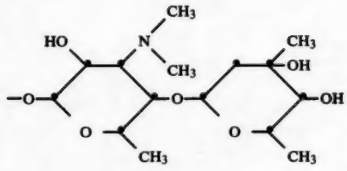
(I)

wherein A represents a group of formula —SR^1 where R^1 is a C_{1-6} alkyl or C_{2-6} hydroxyalkyl group or a monovalent aryl group when B represents a hydrogen atom;

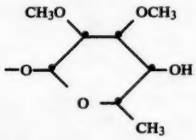
or A and B taken together represent a single chemical bond;

wherein Y^1 represents a group of formula:

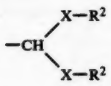




wherein Y^2 represents a group of formula:



and Z represents CHO or a group of formula



where X represents an oxygen or sulfur atom and R^2 is C_{1-3} alkyl or aryl;

provided that, when A and B taken together represent a single chemical bond, then Z cannot be —CHO and X cannot be oxygen;

or a pharmacologically-acceptable salt thereof.

11. A method for treating bacterial infections in warm-blooded mammals which comprises administering to a mammal an amount of a compound of claim **1**, which is effective against bacterial infections.

4,594,339

ANTI-HERPES VIRUS COMPOSITIONS CONTAINING 5-SUBSTITUTED 1-2'(DEOXY-2-'-SUBSTITUTED-β-D-ARABINOFURANOSYL)PYRIMEDENE NUCLEOSIDES

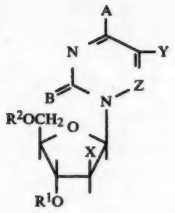
Carlos Lopez, New York; Kyoichi A. Watanabe, Portchester; Uri Reichman, and Jack J. Fox, both of White Plains, all of N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation of Ser. No. 366,104, Apr. 6, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,875

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—42 **9 Claims**

1. Veterinarian composition for the treatment of a herpes virus infection in animals comprising an anti-herpes virus effective amount of a pyrimidine nucleoside, or veterinarianically acceptable acid addition salt thereof, of the formula



wherein

A is OR^3, SR^3, NR^3R^4 or NHacyl wherein R^3 and R^4 are the same or different and are hydrogen, lower alkyl of 1 to 7 carbon atoms, aralkyl, or aryl;

NHacyl is alkanoyl or aroyl amide;

B is oxygen or sulfur;

X is halogen, alkylsulfonyl or arylsulfonyl;

Y is halogen, amino, monoalkyl- or monoaralkylamino, dialkylamino, aminomethyl, hydroxymethyl, lower alkyl, aryl, aralkyl, vinyl and substituted vinyl or ethynyl and substituted ethynyl;

Z is methyne or nitrogen;

R^1 and R^2 are the same or different and are hydrogen acyl or aroyl,

in a veterinarianically acceptable carrier.

4,594,340

25,26-DEHYDRO-1α,24R-DIHYDROXYCHOLECALCIFEROL AND 25,26-DEHYDRO-1α,24S-DIHYDROXYCHOLECALCIFEROL AND THE EPIMERIC MIXTURE

John J. Partridge, Upper Montclair; Shian-Jan Shiuey, Nutley; Gary A. Truitt, Passaic, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 29, 1984, Ser. No. 676,121

Int. Cl.[4] C07J *9/00*

U.S. Cl. 514—167 **12 Claims**

1. A compound 25,26-dehydro-1α,24R-dihydroxycholecalciferol, its 24S-epimer or an epimeric mixture thereof.

3. A method for treating tumors which comprises administering to a host in need of the same a therapeutically effective amount of 25,26-dehydro-1α,24R-dihydroxycholecalciferol, its 24S-epimer or an epimeric mixture thereof.

4,594,341

PERHYDRO-1,4-THIAZEPIN-5-ONE AND PERHYDRO-1,4-THIAZOCIN-5-ONE DERIVATIVES AS ANTIHYPERTENSIVES

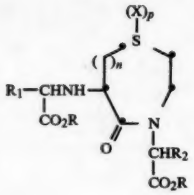
Yak-Fa Cheung, Westfield; Eugene D. Thorsett, Fanwood, and Arthur A. Patchett, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 364,481, Apr. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 270,756, Jun. 5, 1981, abandoned. This application Apr. 29, 1985, Ser. No. 728,132

Int. Cl.[4] A61K *31/55, 31/395;* **C07D** *281/00, 281/18*

U.S. Cl. 514—211 **20 Claims**

17. A method for treating hypertension which comprises administering to a patient in need of such treatment an antihypertensively effective amount of a compound of the formula:



(I)

wherein:

R and R_3 are independently hydrogen, C_1–C_6 alkyl, aryl, and aralkyl;

R_1 is hydrogen; hydrocarbon of from 1 to 12 carbon atoms which include branched, cyclic and straight chain hydrocarbon groups; substituted C_1–C_6 alkyl wherein the substituent can be halo, hydroxy, carboxy, lower alkylthio, lower alkoxy, lower alkoxy carbonyl, lower aralkoxy carbonyl, amino, lower alkylamino, diloweralkylamino, or acylamino; substituted C_1–C_6 alkyl having the formula $R_A(CH_2)_n$—Q—$(CH_2)_m$ wherein n is 0–2, m is 1–3, R_A is aryl or heteroaryl optionally substituted by amino, diloweralkylamino, lower alkylamino, hydroxy, hydroxy loweralkyl, aminoloweralkyl, trihaloloweralkyl, cyano, nitro, sulfonamido, aroyl, lower alkyl, halo, dihalo, and lower alkoxy, and Q is O, S, N—R_B, $CONR_C$, NR_CCO, CH=CH wherein R_B is hydrogen, loweralkyl, aryl, aralkyl, lower alkanoyl, or aroyl, and R_C is hydrogen or lower alkyl; aryl; substituted aryl wherein the substituent is lower alkyl, amino loweralkyl, loweralkoxy, aryloxy, aroyl, hydroxy, halo, or dihalo; aralkyl or heteroaralkyl which include branched lower alkyl groups; substituted aralkyl or substituted heteroaralkyl which include branched lower alkyl groups wherein the lower alkyl groups can be substituted by amino, acylamino, or hydroxyl and the aryl and heteroaryl groups can be substituted by halo, dihalo, loweralkyl, hydroxy, loweralkoxy, aryloxy, aroyl, arylthio, amino, amino lower alkyl, lower alkanoylamino, aroylamino, diloweralkylamino, lower alkylamino, hydroxy loweralkyl, trihalo loweralkyl, nitro, cyano, or sulfonamido;

R_2 is hydrogen or loweralkyl;

n is 1 or 2;

p is 0 or 1;

X is oxygen; and,

the pharmaceutically acceptable salts thereof, wherein in said R–R_3 groups, unless otherwise stated, the loweralkyl groups contain from one to six carbon atoms; aryl and the prefix "ar" represent phenyl, naphthyl or biphenyl; the aralkyl and heteroaralkyl groups contain from one to six carbon atoms in the alkyl portion thereof and represent benzyl, phenethyl, 3,3-diphenylpropyl, or 3-indolylmethyl; heteroaryl represents indolyl, thienyl, imidazolyl, furyl, benzimidazolyl, pyridyl, quinolinyl, isoquinolinyl, and benzothienyl; aroyl denotes benzoyl or 1-naphthoyl; acylamino denotes loweralkanoylamino and aroylamino which are selected from the group consisting of acetylamino, and benzoylamino; and, alkoxy denotes a loweralkyl group bonded to oxygen.

18. The method of claim **17** wherein said compound is a member of the group:

4-N-(1(S)-carboxyethyl)-6(R)-(1(S)-carboethoxy-3-phenylpropylamino)perhydro-1,4-thiazepin-5-one; 4-N-(1(S)-carboxyethyl)-6(R)-(1(S)-carboxy-3-phenylpropylamino)-perhydro-1,4-thiazepin-5-one; 4-N-carboxymethyl-6(R)-(1(S)-carboethoxy-3-phenylpropylamino)perhydro- 1,4-thiazepin-5-one; and, 4-N-carboxymethyl-6(R)-(1(S)-carboxy-3-phenylpropylamino)perhydro-1,4-thiazepin-5-one.

4,594,342

1,5-BENZOTHIAZEPINE DERIVATIVE

Mikio Takeda, Urawa; Tokuro Oh-ishi, Tokyo; Hiromichi Nakajima, Urawa, and Taku Nagao, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

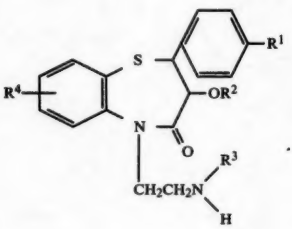
Filed Mar. 22, 1985, Ser. No. 715,115

Claims priority, application United Kingdom, Apr. 10, 1984, 8409259; Apr. 28, 1984, 8410949

Int. Cl.[4] A61K *31/55;* **C07B** *281/10*

U.S. Cl. 514—211 **24 Claims**

1. A 1,5-benzothiazepine of the formula:



(I)

wherein

R^1 is lower alkyl or lower alkoxy;

R^2 is hydrogen or lower alkanoyl;

R^3 is lower alkyl; and

R^4 is lower alkyl or lower alkoxy; or a pharmaceutically acceptable acid addition salt thereof.

24. A method of producing a platelet aggregation-inhibiting effect on a warm-blooded animal comprising administering to said warm-blooded animal an effective amount of a compound claimed in claim **1**.

4,594,343

1-[(AMINOALKYL AND AMINOALKYLAMINO)CARBONYL AND THIOCARBONYL]-α,α-DIARYLPYRROLIDINE, PIPERIDINE AND HOMOPIPERIDINEACETAMIDES AND ACETONITRILES

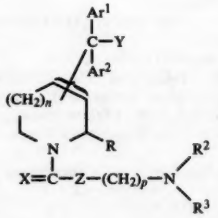
James R. Shanklin, Jr., 8318 Brookfield Rd., Richmond, Va. 23227, and James M. Wilkinson, II, 1432 Bargrove Rd., Richmond, Va. 23235

Filed Oct. 19, 1984, Ser. No. 662,583

Int. Cl.[4] C07D *223/06, 207/06, 211/08;* **A61K** *31/40*

U.S. Cl. 514—212 **21 Claims**

1. A compound selected from the group having the formula:



wherein;

n is selected from zero, one or two;

X is selected from oxygen or sulfur;

Z is selected from

p is selected from 0 to 5 inclusive with the proviso that when Z is

p is at least one;

Y is selected from aminocarbonyl or cyano;

Ar^1 and Ar^2, which may be the same or different, are selected from the group consisting of phenyl or phenyl substituted by 1 to 3 radicals which may be the same or different selected from loweralkyl, lower-alkoxy, halogen or trifluoromethyl;

R is selected from hydrogen or loweralkyl;

R^1, R^2 and R^3 are selected from the group consisting of hydrogen, cycloalkyl, loweralkyl, phenyl, phenyl substituted by halogen, loweralkyl, or loweralkoxy and phenylloweralkyl wherein phenyl may be substituted by halogen, loweralkyl or loweralkoxy, and R^1, R^2 and R^3 may be the same or different;

and when the side group

is in the 3-position and Ar^1 and Ar^2 are dissimilar, the diastereoisomers thereof; and the pharmaceutically acceptable acid addition salts thereof.

4,594,344

1-ARYLOXYPROPANOLAMINES

Herbert Köppe, Ingelheim am Rhein; Wolfgang Abele, deceased, late of Waldalgesheim (by Heiderose Schlussas-Abele, legal representative); Franz Esser; Wolfram Gaida, both of Ingelheim am Rhein, and Wolfgang Hoefke, Wiesbaden, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

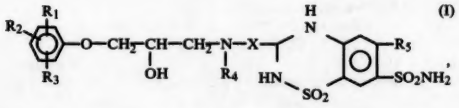
Filed Jul. 15, 1985, Ser. No. 755,044

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 3427309

Int. Cl.[4] C07D *285/30, 417/12;* **A61K** *31/54*

U.S. Cl. 514—222 **31 Claims**

1. A compound of formula I:



(I)

in which

R_1 is a hydrogen or halogen atom, a lower alkyl, lower alkoxy, lower alkoxy lower alkyl, lower alkenyl, lower alkenyl oxy, cyano, hydroxy, trifluoromethyl, nitro, amino, aminocarbonylmethyl, lower monoalkylamino, lower dialkylamino group;

R_2 is a hydrogen or halogen atom, cyano, lower alkyl or lower alkoxy or acylamino group;

R_3 is a hydrogen or halogen atom, a lower alkyl or lower alkoxy group, whilst R_2 and R_3 together can also be a butadienyl or methylene dioxy group;

R_4 is a hydrogen atom or a lower alkyl group;

R_5 is a chlorine atom or a trifluoromethyl group;

X is an alkylene group;

and the non-toxic, pharmaceutically acceptable acid addition salts thereof.

4,594,345

METHYLFLAVONE-8-CARBOXYLATES

Hiroshi Enomoto, Nagaokakyo; Tadatoshi Nomura, Uji; Yoshiaki Aoyagi, Otsu; Shoichi Chokai, Kameoka; Masao Murase, Kusatsu; Kichiro Inoue, and Ichiro Shirahase, both of Kyoto, all of Japan, assignors to Nippon Shinyaku Co. Ltd., Japan

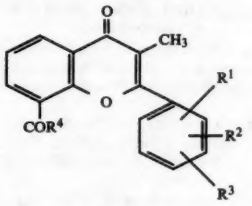
Filed Jun. 24, 1983, Ser. No. 507,692

Claims priority, application Japan, Jun. 23, 1982, 57-108928

Int. Cl.[4] A61K *31/35;* **C07D** *311/30*

U.S. Cl. 514—234 **11 Claims**

1. A compound of the formula (I):



(I)

wherein R^1, R^2 and R^3 are the same or different and are hydrogen, halogen, alkyl of 1 to 15 carbon atoms in total and 1 to 10 carbon atoms in the longest chain, or lower alkoxy; R^4 is hydroxy, lower alkoxy, (hydroxy)lower alkoxy or

wherein R^5 is hydrogen or lower alkyl and R^6 is lower alkyl or cycloalkyl of 5 to 7 carbon atoms, or R^5 and R^6 together with the nitrogen atom to which they are attached form pyrrolidino, piperidino, or morpholino; and, when R^4 is hydroxy, pharmaceutically acceptable salts thereof, provided that when R_1, R_2 and R_3 are each hydrogen, R^4 is other than hydroxy or lower alkoxy.

11. A pharmaceutical composition for the treatment of allergic diseases, or inflammation, which comprises an effective amount of the compound according to claim 1 together with a pharmaceutically acceptable carrier therefor.

4,594,346

3,6-DISUBSTITUTED-1,8-NAPHTHALIMIDES AND METHODS FOR THEIR PRODUCTION AND USE

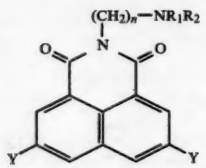
Robert K. Zee-Cheng, Shawnee, and Chia C. Cheng, Leawood, both of Kans., assignors to Warner-Lambert Company, Ann Arbor, Mich.

Continuation of Ser. No. 581,594, Feb. 21, 1984, which is a continuation-in-part of Ser. No. 481,122, Apr. 1, 1983, Pat. No. 4,499,266. This application Jan. 22, 1985, Ser. No. 693,050

Int. Cl.[4] A61K *31/535, 31/44*

U.S. Cl. 514—237 **1 Claim**

1. A method for treating transplantable leukemia in a lower mammal which comprises administering an antileukemically effective amount of a compound having in free base form the structural formula I



I

or a pharmaceutically acceptable salt thereof, where n is 2 or 3, R_1 and R_2 are H, lower alkyl, lower hydroxyalkyl, pyrrolidinyl, morpholino, or piperidinyl, and Y is NO_2 or HN_2, in combination with a pharmaceutically acceptable carrier, to a mammal in need thereof.

4,594,347

PYRROLO [3,2,1-IJ]-QUINOLINE CARBOXYLIC ACID COMPOUND

Hiroshi Ishikawa, Otsu; Tetsuyuki Uno, Tokushima; Hisashi Miyamoto, Tokushima, and Kazuyuki Nakagawa, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co. Limited, Tokyo, Japan

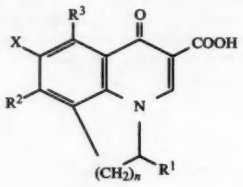
Filed Jan. 24, 1984, Ser. No. 573,409

Claims priority, application Japan, Jan. 26, 1983, 58-11837

Int. Cl.[4] C07D *403/04, 401/04;* A61K *31/495*

U.S. Cl. 514—252 **5 Claims**

1. A benzo-heterocyclic compound of the formula:



wherein

R^1 is a lower alkyl group;

R^2 is a piperazinyl group or a substituted piperazinyl group wherein the substituent is a lower alkyl group or a hydroxy group;

R^3 is an amino group;

X is a halogen atom; and

n is an integer of 1,

and a pharmaceutically acceptable salt thereof.

4,594,348

USE OF SOME 2-[2-[4-PHENYL-1-PIPERAZINYL]ETHYL]-1H-NAPHTH-[1,2-D]IMIDAZOLE DERIVATIVES AND THEIR PHARMACEUTICALLY ACCEPTABLE SALTS IN THE TREATMENT OF CARDIOVASCULAR DISEASES

Emilio Toja; Domenico Barone, and Emiliana Baldoli, all of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

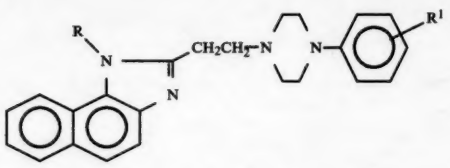
Filed Feb. 6, 1985, Ser. No. 698,653

Claims priority, application United Kingdom, Feb. 7, 1984, 8403141

Int. Cl.[4] A61K *31/50*

U.S. Cl. 514—253 **3 Claims**

1. A method of lowering blood pressure in humans which comprises administering to a patient in need thereof an antihypertensive effective amount of a 2-[2-(4-phenyl-1-piperazinyl-)ethyl]-1H-naphth[1,2-d]imidazole having the formula



wherein R is methyl or 1-methylethyl; R^1 is selected from the group consisting of hydrogen, chloro, methoxy and trifluoromethyl; or a pharmaceutically acceptable acid addition salt thereof.

4,594,349

HYPERURETIC AGENTS

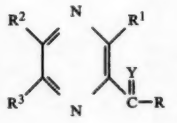
Karl H. Beyer, Jr., P.O. Box 387, Penllyn, Pa. 19422

Filed Jan. 4, 1982, Ser. No. 336,735

Int. Cl.[4] A61K *31/495*

U.S. Cl. 514—255 **5 Claims**

1. A method of treating a hyperuremic condition comprising administering to a host in need of such treatment a therapeutically effective amount of a compound of the formula:



(I.)

wherein

Y is O or NH,

R is OH; $NHCONR^4R^5$; or $N{=}C(NR^4R^5)_2$; where R^4 and R^5 are each independently selected from the group consisting of hyrogen; $C_{1\text{-}10}$ alkyl, straight or branched chain; aryl $C_{1\text{-}4}$ alkyl; mono- or disubstituted aryl $C_{1\text{-}4}$ alkyl where the substituents are fluoro, chloro, bromo, iodo, or $C_{1\text{-}10}$ alkyl, straight or branched chain;

R^1 and R^2 are each independently selected from the group consisting of hydrogen, amino, and mono- or disubstituted amino where the substituents are $C_{1\text{-}10}$ alkyl, straight or branched chain, or $C_{3\text{-}8}$ cycloalkyl; provided that R^1 and R^2 may not both be amino or substituted amino; and

R^3 is hydrogen; fluoro; chloro; bromo; or iodo; and a pharmaceutically acceptable salt thereof.

4,594,350

(3-ETHOXYPROPIONATE) ESTERS OF CYCLARADINE

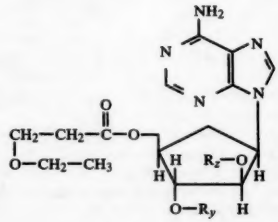
Robert Vince, St. Paul, Minn., assignor to Reagents of University of Minnesota, Minneapolis, Minn.

Filed Jul. 30, 1984, Ser. No. 635,389

Int. Cl.[4] C07D *473/00;* A61K *31/52*

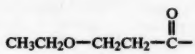
U.S. Cl. 514—261 **20 Claims**

1. A compound represented by the formula:



2

wherein Rz and Ry are independently hydrogen or



or pharmaceutically acceptable salts thereof, in racemic or optically active form.

7. An antivirally effective pharmaceutical composition comprising an antiviral effective amount of the compound of claim 1 in admixture with a pharmaceutically acceptable carrier therefore.

11. A method of treating susceptible viral infections, which comprises administering to a host in need of such treatment a compound of claim 1, or a pharmaceutical composition thereof, in an amount sufficient to treat such infection.

4,594,351

FURAN OR THIOPHENE DERIVATIVES OF IMINOMETHYL PIPERIDINES AND USE TO INHIBIT GASTRIC SECRETION

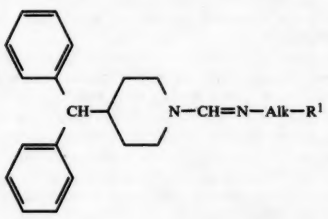
Malcolm K. Scott, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Division of Ser. No. 540,265, Oct. 11, 1983, Pat. No. 4,528,293. This application Apr. 25, 1985, Ser. No. 727,040

Int. Cl.[4] **C07D** *405/12, 417/12;* **A61K** *31/445*

U.S. Cl. 514—320 **17 Claims**

1. A 4-diphenylmethyl-1-imino-methylpiperidine of the following formula (I):



(I)

wherein

Alk is a divalent straight or branched chain alkylene unit of 1 to 12 carbons; and R^1 is a heterocyclic group selected from the group consisting of furan, benzofuran, thiophene or benzothiophene which heterocyclic group may be optionally substituted:

(a) on a 6-membered ring carbon thereof by one or two substituents selected from the group consisting of alkyl, alkoxy, alkylthio, hydroxy, mercapto, nitro, amino, alkylamino, dialkylamino, trifluoromethyl, alkanoylamino, halo, carboxy, carbamoyl or alkoxycarbonyl; (b) on adjacent ring carbons of the phenyl ring of the benzofuran or benzothiophene rings by a methylenedioxy group; and (c) on a carbon atom of a 5-membered ring thereof by one or two substituents selected from the group consisting of alkyl, carboxy or phenyl;

wherein said alkyl portions of the alkyl, alkoxy, alkylthio, alkylamino, dialkylamino and alkoxycarbonyl substituents contain 1 to 6 carbons and said alkanoylamino substituent contains 2 to 8 carbons, and the pharmaceutically-acceptable salts thereof.

15. A pharmaceutical composition which comprises an effective gastric acid secretion inhibiting amount of a piperidine of claim 1, in association with a pharmaceutically-acceptable carrier.

4,594,352

ALKYNYL CONTAINING BENZOYL-UREAS EXERTING AN INSECTICIDAL ACTIVITY

Pietro Massardo, Milan; Franco Bettarini; Gabriele Giovarruscio, both of Novara; Paolo Piccardi; Franca Reggiori, both of Milan; Vincenzo Caprioli, San Martino, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

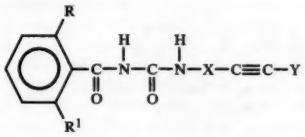
Filed Apr. 19, 1984, Ser. No. 601,923

Claims priority, application Italy, Apr. 22, 1983, 20745 A/83

Int. Cl.[4] **C07D** *213/75;* **C07C** *127/22;* **A61K** *31/44, 31/17*

U.S. Cl. 514—332 **11 Claims**

1. A compound of formula



(I)

in which

one of R and R^1 is fluorine or chlorine and the other is hydrogen, fluorine or chlorine;

X is selected from the group consisting of 1,4-phenylene and pyridyl bound in position 2 to the NH group and in position 5 to the —C≡C— group or vice versa; the 1,4 phenylene substituted by one to two substituents selected from the group consisting of fluorine, chlorine, CF_3, OCF_3, $OCHF_2$, CN, $N(R^2)_2$ (R^2 is C_1–C_4 alkyl), C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio; and the pyridyl substituted by one or two substituents selected from the group consisting of fluorine, chlorine, CF_3, OCF_3, $OCHF_2$, CN, $N(R^2)_2$ (R^2 is C_1–C_4 alkyl), C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio;

Y is selected from the group consisting of phenyl, 2-pyridyl, 3-pyridyl, phenyl substituted by 1 to 4 substituents selected from the group consisting of fluorine, chlorine, CF_3, OCF_3, $OCHF_2$, NO_2, CN, $N(R^2)_2$ (R^2 is C_1–C_4 alkyl), C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_2–C_5 alkenyl, C_2–C_5 alkenyloxy, C_2–C_5 alkenylthio, alkylcarbonyl having 1 to 4 carbon atoms in the alkyl moiety, alkoxycarbonyl having 1 to 4 carbon atoms in the alkyl moiety, aminocarbonyl, and dialkylamino carbonyl having 1 to 4 carbon atoms in each alkyl substituent; and the pyridyl substituted by 1 to 4 substituents selected from the group consisting of fluorine, chlorine, CF_3, OCF_3, $OCHF_2$, NO_2, CN, $N(R^2)_2$ (R^2 is C_1–C_4 alkyl), C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_2–C_5 alkenyl, C_2–C_5 alkenyloxy, C_2–C_5 alkenylthio, alkylcarbonyl having 1 to 4 carbon atoms in the alkyl moiety, alkoxycarbonyl having 1 to 4 carbon atoms in the alkyl moiety, aminocarbonyl, and dialkylaminocarbonyl having 1 to 4 carbon atoms in each alkyl substituent.

11. A method for combatting infestations of harmful insects in the agrarian and civil fields, consisting in applying to said insects or to areas to be protected from said insects, an insecticidally effective amount of at least one compound according to claim 1.

4,594,353

AZOLYL-FURAN-DERIVATIVES HAVING FUNGICIDE ACTIVITY

Roberto Colle, Basiglio; Franco Gozzo, S. Donato Milanese, and Luigi Mirenna, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

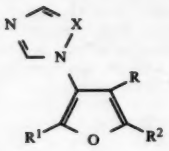
Filed Mar. 26, 1984, Ser. No. 593,278

Claims priority, application Italy, Mar. 31, 1983, 20406 A/83

Int. Cl.[4] **A01N** *43/50, 43/653;* **C07D** *407/04*

U.S. Cl. 514—383 **8 Claims**

1. Compounds of formula



I

wherein

represents a nitrogen atom or a CH group;

R is selected from the group consisting of a hydrogen atom; an alkyl group having from 1 to 4 carbon atoms; an alkenyl or an alkynyl group having from 2 to 5 carbon atoms; an alkoxyl group having from 1 to 4 carbon atoms; a phenyl group or a phenoxy group optionally substituted by one or more groups selected from the group consisting of halogen atoms, alkyl groups having from 1 to 4 carbon atoms, alkoxyl groups having from 1 to 4 carbon atoms and a nitro group; an alkoxycarbonyl group having from 1 to 4 carbons in the alkoxy part, an alkylcarbonyl group having from 1 to 4 carbon atoms in the alkyl part; a benzoyl and a cyano group;

R^1 and R^2 (equal to or different from each other) are each selected from the group consisting of an alkyl group having from 1 to 4 carbon atoms; an alkenyl group or an alkynyl group having from 2 to 5 carbon atoms; a phenyl group optionally substituted by one or more groups selected from the group consisting of halogen atoms, alkyl groups having from 1 to 4 carbon atoms, alkoxyl groups having from 1 to 4 carbon atoms and a nitro group; an alkoxycarbonyl group having from 1 to 4 carbon atoms in the alkoxy part, an alkylcarbonyl group having from 1 to 4 carbon atoms in the alkyl part; a cyano group; or R and R^2 form together a benzene ring orthocondensed with the furan ring.

6. A method for fighting fungus infections in useful plants consisting in distributing on the plants or in the area where they grow, when the fungus infection is foreseen or it is in progress already, an effective amount of a compound according to claim 1, as such or in the form of a suitable composition.

4,594,354

ANIMAL FEED COMPOSITIONS CONTAINING THE ANTIBIOTIC X-537A

Julius Berger, Passaic, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 960,998, Nov. 15, 1978, abandoned, which is a continuation of Ser. No. 759,223, Jan. 13, 1977, abandoned, which is a continuation of Ser. No. 616,540, Sep. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 804,974, Mar. 6, 1969, Pat. No. 3,719,753, which is a continuation-in-part of Ser. No. 672,729, Oct. 4, 1967, abandoned. This application Sep. 30, 1981, Ser. No. 307,040 The portion of the term of this patent subsequent to Mar. 6, 1990, has been disclaimed.

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—460 **16 Claims**

1. A coccidiostatic poultry feed additive premix comprising a poultry feed material and, as the active ingredient, sufficient amount of antibiotic X-537A or a pharmaceutically acceptable salt thereof to provide, upon addition of the premix to a conventional poultry feed, a poultry feed containing, per 100 parts by weight of feed, from about 0.001 parts to about 0.0125 parts of the active ingredient.

4,594,355

PESTICIDES

Michael Elliott, Stevenage; Norman F. Janes, Luton; Richard L. Elliott, Great Bookham; Bhupinder P. S. Khambay, Harrow Weald, and David A. Pulman, Caddington, all of England, assignors to National Research Development Corp., London, England

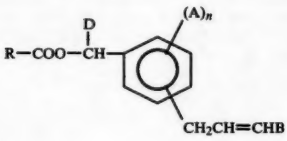
Filed Jul. 26, 1983, Ser. No. 517,393

Claims priority, application United Kingdom, Jul. 29, 1982, 8221860

Int. Cl.[4] A01N *53/00*; C07C *69/743, 121/66*

U.S. Cl. 514—521 **11 Claims**

1. A compound of the formula:



I

wherein

D represents hydrogen or cyano;

B represents hydrogen, methyl, ethyl or vinyl;

A represents methyl;

n is 0, 1 or 2;

RCOO is the residue of an acid RCOOH which is a 2,2-dimethyl-cyclopropane carboxylic acid carrying at the 3-position dihalovinyl, isobutenyl or 2-carbomethoxy-propenyl, provided that

(1) when the group $—CH_2CH=CHB$ is located at the 4-position on the phenyl ring with respect to the ester linkage, then D must be hydrogen and the group carried at the 3-position on the cyclopropane ring of the acid must be dihalovinyl and

(2) when the group $—CH_2CH=CHB$ is located at the 3-position on the phenyl ring with respect to the ester linkage and D is CN, then n must be 0, and

(3) when the group $—CH_2CH=CHB$ is located at the 2 or 3 position on the phenyl ring with respect to the ester linkage, then the group carried at the 3-position on the cyclopropane ring must be dihalovinyl.

9. A pesticidal composition comprising a compound according to claim 1 together with an inert carrier or diluent.

4,594,356

METHOD FOR INDUCING MYDRIASIS IN ANIMALS

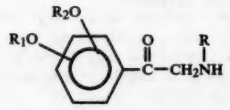
Nicholas Bodor, Gainesville, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Jan. 8, 1985, Ser. No. 689,765

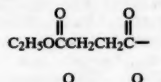
Int. Cl.[4] A61K *31/22, 31/24, 31/225, 31/235*

U.S. Cl. 514—534 **14 Claims**

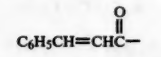
1. A method of inducing pupil diameter enlargement in a subject, comprising topically administering to the eye of the subject an amount effective for inducing pupil diameter enlargement of an adrenalone diester compound of the general formula:



wherein R represents hydrogen or a straight chain alkyl of 1 to 3 carbon atoms, and R_1 and R_2 are the same or different and are selected from the group consisting of:



and



or an ophthalmologically acceptable acid addition salt thereof.

4,594,357

DEPOT ANTIINFLAMMATORY AGENTS

Hans-Dieter Dell, Berg.-Gladbach; Bernhard Pelster, St. Augustin; Reinhold Kraüs, Cologne, and Detlef Schierstedt, St. Augustin, all of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., Cologne, Fed. Rep. of Germany

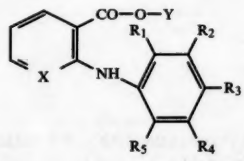
Filed Jun. 20, 1984, Ser. No. 622,425

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324192

Int. Cl.[4] A61K *31/19, 31/24*

U.S. Cl. 514—537 11 Claims

1. A depot agent for intramuscular use containing 3–80% by weight of a compound of the formula (I)



in which

R_1–R_5 represents hydrogen, halogen, alkyl with 1 to 4 C atoms or trihalogenoalkyl,

X represents a CH group and

Y represents hydrogen, metal ions, alkyl with 1–6 C atoms, alkoxy, alkoxyalkyl, hydroxyalkyl, hydroxyalkoxyalkyl or trihalogenoalkyl, the number of C atoms in each case being between 1 and 6 and to be straight-chain or branched and

a suspension medium containing one or more suspension agents selected from the group consisting of: viscoleo, isopropyl myristate, ethyl oleate, castor oil, sesame oil, arachis oil, cottonseed oil, almond oil, olive oil, neat's foot oil, neutral oil and maize oil.

4,594,358

ANALGESIC METHOD

Martin D. Hynes, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 25, 1985, Ser. No. 705,177

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—651 9 Claims

1. A method of potentiating dextropropoxyphene analgesia in mammals which comprises the administration to said mammal of an effective amount of fluoxetine or norfluoxetine in the time range between 24 hours before and 2 hours after the administration of dextropropoxyphene.

4,594,359

PHARMACEUTICAL COMPOSITIONS

John M. Padfield, Meldreth, and Cheryl V. Groom, Barnard Castle, both of United Kingdom, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 498,724, May 27, 1983, abandoned. This application Mar. 26, 1984, Ser. No. 593,432

Claims priority, application United Kingdom, May 27, 1982, 8215502

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—647 14 Claims

1. A pharmaceutical composition comprising an aqueous dispersion of one or more cellulose derivatives containing salbutamol and/or one or more of its physiologically acceptable salts, wherein the cellulose derivative is an alkyl and/or hydroxyalkyl ether of cellulose; carboxymethyl cellulose or salts thereof; and wherein the amount of cellulose derivative present in the composition is a salbutamol stabilizing effective amount of said cellulose derivative.

4,594,360

CHLORONITROALKANE INSECTICIDES

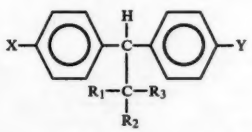
Joel R. Coats, Ames, Iowa, assignor to Iowa State University Research Foundation & Inc., Ames, Iowa

Filed Nov. 23, 1984, Ser. No. 674,493

Int. Cl.[4] A01N *33/20, 33/22;* C07C *79/35*

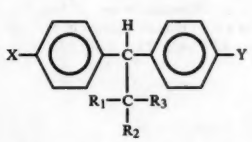
U.S. Cl. 514—716 14 Claims

1. Compounds of the formula:



wherein X is a C_1 to C_3 alkoxy group, Y is selected from the group consisting of halogens, C_1 to C_4 alkyl, and C_1 to C_3 alkoxy, and R_1, R_2 and R_3 are selected from the group of cloro, nitro and hydrogen, with at least one of R_1, R_2 and R_3 being chloro, and at least one of R_1, R_2 and R_3 being nitro.

5. An insecticidal composition comprising as an essential active ingredient, an insecticidal amount of compound of the general formula:



wherein X is a C_1 to C_3 alkoxy group, Y is selected from the group consisting of halogens, C_1 to C_4 alkyl, and C_1 to C_3 alkoxy, and R_1, R_2 and R_3 are selected from the group of cloro, nitro and hydrogen, with at least one of R_1, R_2 and R_3 being chloro, and at least one of R_1, R_2 and R_3 being nitro and an inert insecticidal carrier for said compounds.

4,594,361

STABILIZED POLYBROMIDE RESINS AND METHOD OF PREPARATION

William H. Beauman, Chicago; Dean J. Jarog, Villa Park, and Steven H. Micklin, Chicago, all of Ill., assignors to Everpure, Inc., Westmont, Ill.

Filed Nov. 26, 1984, Ser. No. 674,609

Int. Cl.[4] C02F *1/50*

U.S. Cl. 521—28 9 Claims

7. The method of preparing a stabilized polybromide resin

product for use in disinfecting water, in which water-containing porous beads of a quaternary ammonium anion exchange resin are loaded with bromine, wherein the improvement comprises:

(a) loading said resin beads in a bromine-containing water slurry thereof, said loading providing the beads with excess bromine above the bromine content desired in the final product;

(b) removing external water from the loaded beads while leaving the beads in a moist sticky condition, said beads containing from 28 to 38% bromine based on the weight of loaded beads and being at least partially in pentabromide form;

(c) passing moisture-evaporating air through a mass of said moist beads at a controlled temperature and velocity effective to remove internal water gradually therefrom, the bromine content of said beads also being reduced as said internal water is removed; and

(d) continuing the gradual drying of step (c) until said beads contain from 0.5 to 2.0% water and from 25 to 35% bromine based on the final weight of the beads said beads remaining at least partially in the pentabromide form, whereby the resulting resin product provides increased bromine stability and more uniform bromine release.

8. The stabilized polybromide resin product produced by the method improvement of claim **7**.

9. The method improvement of claim **7** in which said resin comprises a styrene polymer providing benzyltrimethyl ammonium anion exchange sites.

4,594,362

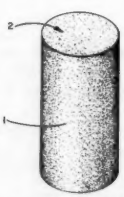
FRIABLE FOAM TEXTILE CLEANING STICK

James A. Smith, Old Tappan, and Betty J. Murphy, Upper Montclair, both of N.J., assignors to Creative Products Resource Associates, Ltd., Clifton, N.J.

Continuation-in-part of Ser. No. 684,384, Dec. 20, 1984, Pat. No. 4,548,954, and a continuation-in-part of Ser. No. 684,746, Dec. 20, 1984, each is a continuation-in-part of Ser. No. 511,185, Jul. 6, 1983, Pat. No. 4,563,483. This application Oct. 31, 1985, Ser. No. 793,166

Int. Cl.[4] C08J *9/38*

U.S. Cl. 521—52 **21 Claims**



1. A textile cleaning stick having a tensile strength of less than about 1. lb comprising a friable open celled reticulated hydrophillic polyurethane foam matrix, wherein said matrix integrally incorporating (a) abrasive particles silane-coupled within said matrix and (b) an aqueous phase incorporating an effective amount of an organic solvent dispersed therein, so that said foam matrix yields oil and water absorbent shreds when it is rubbed across a textile surface.

4,594,363

PRODUCTION OF CORE-SHEATH POLYMER PARTICLES CONTAINING VOIDS, RESULTING PRODUCT AND USE

Robert M. Blankenship, Lansdale, and Alexander Kowalski, Plymouth Meeting, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 11, 1985, Ser. No. 690,913

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.[4] C08J *9/28*

U.S. Cl. 521—64 **17 Claims**

1. Process for making core-sheath polymer particles containing voids, said particles useful for opacifying, comprising (A) emulsion polymerization a core from a core monomer system comprised of at least one ethylenically unsaturated monomer containing acid functionality; (B) encapsulating said core with a hard sheath by emulsion polymerizing a sheath monomer system in the presence of said core, said sheath permitting penetration of fixed or permanent bases; and (C) swelling at elevated temperature the resultant core-sheath polymer particles with fixed or permanent base so as to produce a dispersion of particles which, when dried, contain a microvoid which causes opacity in compositions in which they are contained, provided that either (1) said sheath comprises at least about 1% acid functional monomer or (2) said swelling takes place in the presence of solvent.

16. Composition comprising core-sheath polymer particles prepared by the process of claim **1**.

4,594,364

HALOGENATED PHOSPHORUS HYDROXY-ALKYL AND T-ALKOXYALKYL ESTERS

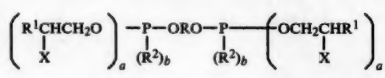
Chester E. Pawloski, Bay City, and Sally P. Ginter, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 476,662, Mar. 18, 1983, Pat. No. 4,510,101. This application Jan. 14, 1985, Ser. No. 691,321

Int. Cl.[4] C08L *75/04*; C08G *18/28*

U.S. Cl. 521—85 **6 Claims**

1. A polyurethane reaction product of a mixture comprising an organic polyisocyanate and an α-halo hydroxyalkyl phosphorus compound corresponding to the formula



wherein

R independently in each occurrence is alkylene, haloalkylene, alkenylene, haloalkenylene, phenylene, diphenylene, halophenylene, dihalophenylene, and oxyalkylene;

R^1 independently in each occurrence is hydrogen, CH_2OR^3, CH_2OH, haloalkyl, phenyl, halophenyl or methyl phenoxy;

R^2 independently in each occurrence is haloalkyl, phenyl, haloaryl or alkyl;

R^3 independently in each occurrence is t-alkyl;

x independently in each occurrence is bromine or chlorine;

a is independently in each occurrence 1 or 2; and

b is independently in each occurrence 0 or 1.

with the proviso that at least one R^1 is CH_2OR^3 or CH_2OH.

4,594,365

ERODIBLE SHIP-BOTTOM PAINTS FOR CONTROL OF MARINE FOULING

David B. Russell, Piscataway; Melvin H. Gitlitz, Edison; Howard H. Leiner, Cranbury; Mo A. Khuddus, Matawan, and Abe Berger, Summit, all of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

PCT No. PCT/US84/00068, § 371 Date Jan. 17, 1984, § 102(e) Date Jan. 17, 1984, PCT Pub. No. WO84/02915, PCT Pub. Date Aug. 2, 1984

Continuation-in-part of Ser. No. 458,377, Jan. 17, 1983, abandoned. This PCT application Jan. 17, 1984, Ser. No. 619,167

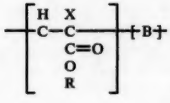
Int. Cl.[4] C08L *31/00, 31/02;* C09D *5/14*

U.S. Cl. 523—122 1 Claim

1. A antifouling paint for protecting marine surfaces, comprising in combination:

(a) toxicant and

(b) a film forming water insoluble, seawater erodible substantially organotin free polymeric binder, said polymeric binder having recurring groups represented by the formula



wherein

B is the residue of an ethylenically unsaturated monomer,

X is H or CH_3,

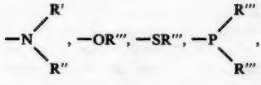
R is selected from the group consisting of:

(a) $-(CH_2)_nY$

wherein

n is an integer from 1 to 4; and

Y is selected from the group consisting of



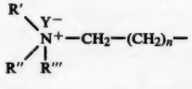
and wherein

R′ is C_1 to C_4 primary, secondary or tertiary alkyl,

R″ is H or R′;

R‴ is alkyl or an aryl;

(b) a quaternized amino alkyl represented by the formula



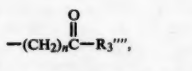
where

Y is Br, Cl or I,

R′, R″ and R‴ are the same or different C_1 to C_{18} alkyls;

(c) haloalkyl having at least one trihalomethyl group, where the halogen is Br, F or Cl and the alkyl has at least two carbons; and

(d)



where n is 1 or 2 and R⁗ is R′ or a phenyl group.

4,594,366

CONNECTED BRANCHED POLYOLS AND POLYURETHANES BASED THEREON

Glenn A. Taylor, South Charleston, and Kenneth L. Hoy, Saint Albans, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 562,453, Dec. 20, 1983, abandoned, which is a continuation of Ser. No. 509,089, Jun. 29, 1983, abandoned. This application Dec. 7, 1984, Ser. No. 679,611

Int. Cl.[4] C08G *18/14, 18/64;* C08K *5/05*

U.S. Cl. 521—137 52 Claims

1. A normally liquid, stable polymer/polyol composition formed by polymerizing in the presence of a free radical catalyst, (1) from about 10 to about 50 weight percent of an ethylenically unsaturated monomer or monomers dissolved or dispersed in (2) from about 50 to about 90 weight percent of a polyol mixture comprising (a) a base polyol and (b) a connected branch polyol comprising a core segment having a number average molecular weight of at least about 240, one core branch unit directly connected to each end of said core segment, at least one additional branch unit at each end connected directly or indirectly to said core branch units, said branch units forming a branch unit segment, and linear polymer segments connected to said branch units and having a number average molecular weight of at least about 240, said connected branch polyol being present in an amount ranging from the amount sufficient to stabilize the polymer/polyol to 100 weight percent of the polyol mixture.

18. A process for producing a normally liquid, stable polymer/polyol which comprises: (a) providing a polyol mixture comprising (1) a base polyol and (2) a connected branch polyol comprising a core segment having a number average molecular weight of at least about 240, one core branch unit directly connected to each end of said core segment, at least one additional branch unit at each end connected directly or indirectly to said core branch units, said branch units forming a branch unit segment, and linear polymer segments connected to said branch units, said linear polymer segments having a number average molecular weight of at least about 240, (b) dissolving or dispersing from about 10 to about 50 weight percent of an ethylenically unsaturated monomer or monomers in from about 50 to about 90 weight percent of said polyol mixture, and (c) polymerizing the ethylenically unsaturated monomer or monomers dissolved or dispersed in said polyol mixture in the presence of a free radical catalyst, said connected branch polyol being present in an amount ranging from the amount sufficient to stabilize the resulting polymer/polyol to 100 weight percent of said polyol mixture.

4,594,367

ANTISTATIC COMPOSITION AND ARTICLES MADE THEREFROM

Geissel Francis A., Agincourt, Canada; William W. Alexander, Belcamp, and John Rys-Sikora, Bel Air, both of Md., assignors to Bata Limited, Ontario, Canada

Filed Apr. 1, 1985, Ser. No. 718,441

Int. Cl.[4] A43B *1/14;* C09G *1/00;* C08K *5/15, 5/09*

U.S. Cl. 523—167 7 Claims

1. A polymer blend composition consisting essentially of, based on parts by weight: (a) polyvinyl chloride: 100 parts; (b) carboxylated nitrile copolymer: 30–40 parts; (c) nonionic antistatic agent: 5–8 parts; (d) metallic stabilizers; 2–5 parts; (e) epoxidized oil: 5–10 parts; (f) primary phthalate or adipate plasticizer: 50–90 parts; and (g) lubricant selected from the group consisting of stearic acid, zinc stearate, calcium stearate and low molecular weight polyethylenes: 1–2 parts; the resulting polymer blend being antistatic and flexible.

4,594,368

PHENOL-FORMALDEHYDE INTUMESCENT COATING COMPOSITION AND COATING PREPARED THEREFROM

Ival O. Salyer, Dayton, and Bernard L. Fox, Centerville, both of Ohio, assignors to University of Dayton, Dayton, Ohio

Continuation of Ser. No. 391,044, Jun. 22, 1982, abandoned. This application Jun. 27, 1984, Ser. No. 625,179

Int. Cl.[4] C09K *3/28;* C08N *9/32*

U.S. Cl. 523—179 33 Claims

1. An intumescent coating consisting essentially of phenol-formaldehyde prepolymer, a blowing agent, and a nucleating agent dispersed in said prepolymer, said prepolymer being soluble in acetone and dichloromethane in an amount greater than 10 percent by weight and being solid at room temperature (23° C.), and said coating being characterized in that it is unfoamed in its coated condition and it is foamable in situ to a flame and heat resistant foam upon exposure to intense heat flux or flame.

4,594,369

PROCESS FOR PRODUCING CORROSION INHIBITING PARTICLES

David G. Othen, Bracknell, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Jun. 28, 1985, Ser. No. 749,751

Claims priority, application United Kingdom, Jul. 10, 1984, 8417525

Int. Cl.[4] C08K *3/32, 3/28, 3/10*

U.S. Cl. 523—200 11 Claims

1. A process for producing corrosion inhibiting particles comprising binding corrosion inhibiting anions to particles of an inorganic oxide by ion-exchange to form anion-exchanged particles, the anions of which are releasible by further ion-exchange characterised in that inorganic oxide particles having surface hydroxyl groups are contacted with an acidic solution containing labile anions at a pH sufficiently below 7 for the protons of the hydroxyl groups to be replaced by the labile anions and thereafter contacting the particles of the labile anion-exchanged inorganic oxide with a solution containing the required corrosion inhibiting anions so that the labile anions are replaced by the corrosion inhibiting anions, the said labile anions being anions of water-soluble, acidic compounds which have a lower affinity for the oxide surface than the required corrosion inhibiting anions and which form a soluble salt with the cation of the compound providing the corrosion inhibiting anions.

4,594,370

AMINE-FORMALDEHYDE MICROENCAPSULATION PROCESS

David G. Adkins, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 29, 1985, Ser. No. 717,930

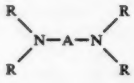
Int. Cl.[4] C08K *9/00*

U.S. Cl. 523—208 16 Claims

1. A process for producing microcapsules which comprises:

forming an agitating aqueous system having discrete particles of an oily core material dispersed therein, said aqueous system being a solution of a polyol and an amine or an amine-formaldehyde precondensate, and

condensing formaldehyde with the amine to form a condensation product which is insoluble in said system and which forms a solid capsule wall surrounding said particles of core material wherein said polyol has the structural formula



where A is an alkylene bridge having 1 to 4 carbon atoms and each R represents a hydroxyalkyl group having 1 to 6 carbon atoms.

4,594,371

FINE PARTICLE DISPERSIONS OF INCOMPATIBLE POLYMERS IN POLYMER MATRICES

E. Bruce Nauman, Schenectady, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Continuation-in-part of Ser. No. 646,311, Aug. 31, 1984, abandoned. This application May 2, 1985, Ser. No. 729,529

Int. Cl.[4] C08G *77/34*

U.S. Cl. 523—340 8 Claims

1. A method of manufacturing a two phase dispersion of a first polymer in a matrix of a second polymer where the polymers are incompatible initially and have high molecular weights, comprising forming a single-phase mixture of the first and second polymers in a sufficient amount of a solvent which is common to the first and the second polymers and which does not constitute more than about 99% by weight of said single-phase mixture, the solvent being selected to be sufficiently volatile so that it can be evaporated at temperatures which are not destructive to the polymers and the solvent-free volume fraction of the first polymer being at most about 0.2, heating the single phase mixture under pressure, and thereafter introducing the mixture into a zone of reduced pressure for flash evaporating the solvent to form a two phase mixture and the matrix, the pressure being selected so that after the flash evaporating the two phase mixture contains about 50% solvent.

4,594,372

POLYVINYL CHLORIDE COMPOSITION

Miltcho A. Natov; Stefanka V. Vassileva, both of Sofia; Hristo B. Kotchev, Pleven; Zvetan S. Djagarov, Pleven, and Nikola N. Popov, Pleven, all of Bulgaria, assignors to Vish Chimiko-Technologitcheski Institute, Sofia, Bulgaria

Filed Aug. 27, 1984, Ser. No. 644,780

Claims priority, application Bulgaria, Aug. 25, 1983, 62196

Int. Cl.[4] C08K *9/04;* C08L *97/02*

U.S. Cl. 523—208 3 Claims

1. An improved polyvinyl chloride composition containing stabilizers, plasticizers, lubricants, and wood meal, wherein the improvement comprises an addition consisting of novolak phenol formaldehyde resin, hardened by Formalin in the presence of a metallic agent selected from the group consisting of calcium oxide, calcium hydroxide, and magnesium oxide.

4,594,373

CURABLE EPOXY RESIN COMPOSITIONS

Dalip K. Kohli, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 578,402, Feb. 9, 1984, Pat. No. 4,521,583. This application Apr. 26, 1985, Ser. No. 714,137

Int. Cl.[4] C08L *63/00;* C08K *3/04*

U.S. Cl. 523—400 10 Claims

1. A fiber resin matrix composition comprising:

A. reinforcing filaments, and

B. a heat curable epoxy resin composition comprising:

(a) an epoxy prepolymer or combination of prepolymers having more than one epoxide group per molecule, and

(b) a curing catalyst for said epoxy consisting essentially of

(i) An amount effective to cure said epoxy of a bisurea compound comprising the reaction product of an organic diamine with at least two moles, per mole of organic diamine, of an aryl monoisocyanate, alone, or in further combination with

(ii) an amount effective to cure said epoxy of an amine functional aromatic curing agent and, optionally,

(c) a second homogenous or heterogeneous resin component blended and alloyed with components (a), (b)(i) and (b)(ii) in an amount sufficient to enhance toughness

and resistance to failure under hot/wet stress conditions in composites produced from said composition.

4,594,374

PROCESS FOR THE PRODUCTION OF AQUEOUS DISPERSIONS AND USE THEREOF FOR THE PRODUCTION OF METAL EFFECT LACQUER COATINGS

Hans-Georg Stahl, Oldenburg; Jürgen Schwindt, Leverkusen, and Klaus Nachtkamp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,672

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409080

Int. Cl.⁴ C09D *3/52, 3/72*

U.S. Cl. 523—501 **2 Claims**

1. Process for the production of an aqueous metal effect-base lacquer based on:

(A) from 10 to 30 parts, by weight, oil-free polyester or alkyd resin having an average functionality per molecule of from 2.5 to 10, an average degree of condensation per molecule of from 10 to 25, an average urethane group content per molecule of from 3 to 6, and containing moieties of condensed 2,2-di(hydroxymethyl)carboxylic acids, hydroxypivalic acid, or both, corresponding to an acid number of from 15 to 30, up to at least 80% of which are neutralized;

(B) from 2.5 to 15 parts, by weight, water-soluble aminoplast resin;

(C) from 2 to 10 parts, by weight, aluminum bronze;

(D) from 0.1 to 10 parts, by weight, non-ionic emulsifier; and

(E) organic solvent;

characterized in that a resin having a maximum acid number of 30 and a maximum hydroxyl number of 150 is used as component (A) and this is mixed with the other components in the form of an aqueous dispersion having a solids content of from 30 to 50%, by weight.

4,594,375

BIS-(IMIDE-SULFONATE) FLAMEPROOFING AGENTS, THEIR PREPARATION AND THEIR USE FOR FLAMEPROOFING IN POLYCARBONATE

Sivaram Krishnan, Pittsburgh, Pa.; Klaus Kircher, Leverkusen, and Hans-Jürgen Kress, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 617,198

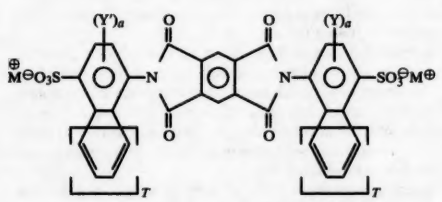
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1983, 3322057

Int. Cl.⁴ C08K *5/16*

U.S. Cl. 524—89 **9 Claims**

1. Bis-(imide-sulphonates) of the general formula

(I)



wherein

Y and Y' independently of one another represent an alkyl radical with 1 to 4 carbon atoms,

a is 0, 1, 2, 3 or 4,

T is 0 or 1 and

M is an alkali metal.

4,594,376

PROPYLENE POLYMER COMPOSITION

Yoshinori Hamada, Oita, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,226

Claims priority, application Japan, Sep. 7, 1983, 58-163200; Sep. 8, 1983, 58-164137; Sep. 22, 1983, 58-174372

Int. Cl.⁴ C08K *5/34*

U.S. Cl. 524—101 **3 Claims**

1. A propylene polymer composition comprising (i) 100 parts by weight of at least one propylene polymer selected from the group consisting of polypropylenes and propylene-ethylene copolymers having an ethylene content of 7% by weight or less, (ii) 0.01 to 0.25 part by weight of at least one modifier selected from the group consisting of triallylcyanurate and triallylisocyanurate, and (iii) 0.005 to 0.2 part by of an organic peroxide.

4,594,377

MODIFIED THERMOPLASTIC COPOLYETHERIMIDE ESTER ELASTOMERS

Russell J. McCready, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 665,315, Oct. 26, 1984, Pat. No. 4,544,734. This application Jun. 3, 1985, Ser. No. 740,661

Int. Cl.⁴ C08K *5/34;* **C08L** *67/02*

U.S. Cl. 524—101 **32 Claims**

1. A polyetherimide ester composition comprising (A) the reaction product of

(a) one or more low molecular weight diols,

(b) one or more dicarboxylic acids, and

(c) a combination of (i) one or more polyoxylalkylene diimide diacids and (ii) one or more dimer acids wherein the amount of dimer is from about 5 to about 40 percent by weight based on the combined weight of (i) and (ii) and

(B) a stabilizer therefore.

4,594,378

POLYMERIC COMPOSITIONS, OIL COMPOSITIONS CONTAINING SAID POLYMERIC COMPOSITIONS, TRANSMISSION FLUIDS AND HYDRAULIC FLUIDS

Craig D. Tipton, Perry, and Kent B. Grover, Chardon, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Mar. 25, 1985, Ser. No. 715,428

Int. Cl.⁴ C08K *5/00, 5/01*

U.S. Cl. 524—106 **58 Claims**

1. A polymeric composition comprising a mixture of

(A) from about 0.1% to about 20% by weight of at least one oil-soluble homopolymer of a non-aromatic mono-olefin having at least three carbon atoms, said homopolymer having a number average molecular weight of from about 850 to about 10,000,

(B) at least one nitrogen-containing ester of a carboxy-containing interpolymer derived from at least two monomers, one of said monomers being (i) an aliphatic olefin or a vinyl aromatic monomer, and the other of said monomers being (ii) at least one alpha, beta-unsaturated aliphatic carboxylic acid, anhydride or ester thereof, said interpolymer having a reduced specific viscosity of from about 0.05 to about 2, said nitrogen-containing ester being characterized by the presence within its polymer structure of the following polar groups which are derived from the carboxy groups of said interpolymer:

(a) at least one carboxylic ester group having at least 8 aliphatic carbon atoms in the ester group,

(b) at least one carbonylpolyamino group derived from reacting a carboxy group of said interpolymer with a polyamino compound having one primary of secondary amino group and at least one tertiary amino or heterocyclic amino group; and

(C) an effective amount of at least one low temperature viscosity reducing liquid organic diluent.

4,594,379

NON-FOGGING COATING COMPOSITION AND A SHAPED ARTICLE COATED THEREWITH

Masaaki Funaki, Toyonaka; Noboru Ohtani; Motoaki Yoshida, both of Nishinomiya; Akira Fujioka, Osaka, and Kazuo Sakiyama, Ibaraki, all of Japan, assignors to Nippon Sheet Glass Co., Ltd. and Sumitomo Chemical Company, Limited, both of Osaka, Japan

Continuation of Ser. No. 268,106, May 28, 1981, Pat. No. 4,522,966. This application Apr. 17, 1985, Ser. No. 724,178

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—114 **2 Claims**

1. A non-fogging transparent coating composition free of organophosphate ester and amine-aldehyde resin crosslinking agents and complex salt photoinitiators, which comprises:

(A) an effective amount up to 50 parts by weight

$$\text{(calculated as } R_a^1\text{—Si—O}_{\frac{4-a-b}{2}}\text{)}$$
(R_b^2 above Si)

of at least one compound selected from the group consisting of epoxy group-containing organic silane compounds represented by the general formula (1):

$$R_a^1\text{—Si—(OR}^3)_{4-a-b} \quad (1)$$
(R_b^2 above Si)

wherein R^1 stands for an organic group having an epoxy group, R^2 for a hydrogen atom, a hydrocarbon group having 1 to 6 carbon atoms or a vinyl group, R^3 for a hydrocarbon group having 1 to 5 carbon atoms, an alkoxyalkyl group or an acyl group having 1 to 4 carbon atoms, a for an integer having the value of 1 to 3 and b 0 or for an integer having the value of 1 to 2, providing that $a+b \leqq 3$ is satisfied, and partial hydrolyzates thereof,

(B) 20 to 80 parts by weight selected from triethylene glycol and a polyhydric alcohol which has an ethylene oxide chain and a molecular weight of 200 to 2000 and is capable of reacting with a mixture of the components (A) and (C) to form a coating film,

(C) 10 to 75 parts by weight of a polymer or copolymer containing at least 20% by weight of repeating structural units represented by the general formula (2):

$$\text{—(CH—C)—} \quad (2)$$
(R^4 above CH; R^5 above C; X below C)

wherein, R^4 and R^5 independently stand for a hydrogen atom, a lower alkyl group or a carboxyl group and X stands for a side chain possessing an epoxy group, and

(D) a catalytic amount of a curing catalyst, providing that the total of the amounts of the aforementioned components (A),

(B) and (C) is 100 parts by weight.

4,594,380

ELASTOMERIC CONTROLLED RELEASE FORMULATION AND ARTICLE COMPRISING SAME

John T. Chapin, Alpharetta, and Raffaele A. Sabia, Atlanta, both of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 1, 1985, Ser. No. 729,267

Int. Cl.[4] C08L *75/04*

U.S. Cl. 524—144 **17 Claims**

1. An article comprising an elastomeric matrix and at least one biologically or nonbiologically active agent contained in the matrix, the active agent to be released from the matrix into the environment substantially continuously over an extended period of time, the matrix material having a modulus between about 10^4 Pa and about 10^8 Pa at 23° C. and a glass transition temperature T_g less than 0° C., the matrix comprising polyurethane formed by a process comprising reacting a polyol with an isocyanate,

(a) the polyol comprising a major component selected from the group consisting of hydroxyl-terminated polybutadiene, hydroxyl-terminated polyisoprene, hydroxyl-terminated copolymers of butadiene with acrylonitrile, hydroxyl-terminated copolymers of butadiene with styrene, hydroxyl-terminated copolymers of isoprene with acrylonitrile, hydroxyl-terminated copolymers of isoprene with styrene, and mixtures of the above, the major component being at least 90% by weight of the total amount of the polyol, the polyol having an average molecular weight in the range 400–10,000;

(b) the isocyanate is selected from the group consisting of the aromatic isocyanates, the cycloaliphatic isocyanates, the aliphatic isocyanates, the heterocyclic isocyanates, and mixtures thereof, the isocyanate having an average molecular weight in the range 80–1000 and an average functionality between about 2 and about 3, the NCO/OH ratio of polyol and isocyanate being in the range of 0.8 to 1.2.

4,594,381

METHOD FOR IMPROVED METAL ADHESION AND METAL ADHESION RETENTION

James A. Davis, Uniontown, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 5, 1985, Ser. No. 741,410

Int. Cl.[4] C08K *5/09;* **C08L** *7/00, 9/00, 61/10*

U.S. Cl. 524—396 **7 Claims**

1. A method for improving metal adhesion and metal adhesion properties between a vulcanizable rubber composition and brass or zinc or brass-plated or zinc-plated metallic reinforcing elements comprising the steps of:

dispersing from about 0.5 to about 12.5 parts by weight of an organic salt of nickel or cobalt selected from the group consisting of aliphatic and aromatic monocarboxylic acids having from one to about 22 carbon atoms and aliphatic and aromatic dicarboxylic acids having from two to about 22 carbon atoms per 100 parts of rubber component in said rubber composition; and

dispersing from about 0.5 to 15 parts by weight of a thermosetting two-step phenolic resin per 100 parts of the rubber component in said rubber composition prior to curing; wherein said vulcanizable rubber composition is selected from the group consisting of natural and synthetic rubbers having a diene unsaturation of about 95 percent, and mixtures, thereof.

4,594,382

THERMALLY STABILIZED CARBOXYL-CONTAINING ETHYLENE COPOLYMERS AND PREPARATION THEREOF

Stephen M. Hoenig, Angleton; David P. Flores, Lake Jackson, and Gregory S. O'Connell, Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 16, 1984, Ser. No. 672,004
Int. Cl.[4] C08K 5/09
U.S. Cl. 524—400 40 Claims

1. A carboxyl-containing ethylene copolymer composition having improved resistance to melt flow value reduction at molten conditions, consisting essentially of:

(a) a copolymer ethylene and from about 0.01 to about 50 percent by weight of said copolymer of a carboxyl-functional comonomer copolymerized therewith; and

(b) a hydrated compound in intimate admixture with said copolymer, said hydrate dehydrating at a temperature between about 100° C. and about 300° C., said hydrate present in an amount of from about 0.01 to about 0.45 percent by weight of said composition.

4,594,383

COPOLYMER, A FILM FORMING COMPOSITION AND A METHOD OF COATING A SURFACE WITH THE COMPOSITION

Sidney G. Fogg, Ashtead, and Frank C. Robertson, Woking, both of England, assignors to The British Petroleum Company p.l.c., London, England

Division of Ser. No. 494,008, May 12, 1983. This application Dec. 26, 1984, Ser. No. 685,216
Claims priority, application United Kingdom, May 26, 1982, 8215395; Oct. 21, 1982, 8230073
Int. Cl.[4] C08K 3/20
U.S. Cl. 524—510 8 Claims

1. A film forming composition comprising an acrylic copolymer containing hydrazide groups and a cross-linking agent wherein the acrylic copolymer containing hydrazide groups is the reaction product of (a) a copolymer formed by polymerising a mixture comprising a major proportion of monomer units which are methyl acrylate or methyl methacrylate and a minor proportion of co-monomer units which are one or more alkyl esters of acrylic acid or methacrylic acid in which the alkyl group comprises at least four carbon atoms and (b) hydrazine, which is reacted with the monomer units and comonomer units in the presence of water, and wherein the cross-linking agent is a water-soluble aldehyde or an organic thermosetting resin containing methylol or methoxy groups and wherein the acrylic copolymer containing hydrazide groups and cross-linking agent are dissolved or dispersed in an aqueous medium in such proportions that they will form a film when applied to a surface.

4,594,384

ADHESIVE COMPOSITION PARTICULARLY FOR MANUFACTURING WOOD CONSTRUCTIONS, PANELS AND OTHER SIMILAR WOOD PRODUCTS

Harri Kilpeläinen, Vantaa, and Pentti Kankaanpää, Kerava, both of Finland, assignors to Valtion Teknillinen Tutkimuskeskus, Finland

Filed Dec. 21, 1984, Ser. No. 684,606
Int. Cl.[4] C10F 9/00; C09J 3/14; C08L 61/12
U.S. Cl. 524—705 4 Claims

1. Resorcinol-phenol resin based aqueous adhesive composition, comprising a hardenable mixture of 40–90% by weight resorcinol-phenol resin, the dry matter content of which is 30–60% by weight, and 60–10% by weight humus substance extract prepared from peat, the percentages being based on the total composition, the extract being prepared by treating dry ground peat with an aqueous alkaline solution having an alkaline concentration of up to about 5% and sufficiently to extract into the solution the extractable humus content therefrom without extracting the lignin contained in the peat and such that the lignin remains in the solid matter of the peat and drying the alkaline solution extracted humus substance content, and grinding the dried humus substance content and then admixing it with water to form the extract, and including in the composition 5–20% by weight formaldehyde or paraformaldehyde based on the mixture as hardener.

4,594,385

COATING AGENTS OF POLYURETHANE DISPERSIONS AND THE USE THEREOF FOR TOP COATS AND FINISHES

Wilhelm Thoma, Leverkusen; Klaus Noll, Cologne; Klaus Nachtkamp, Cologne; Josef Pedain, Cologne, and Walter Schröer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 24, 1982, Ser. No. 411,137
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134161
Int. Cl.[4] C08L 75/00
U.S. Cl. 524—839 12 Claims

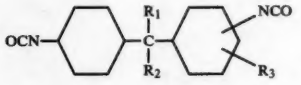
1. A coating agent based on an aqueous, polyurethane dispersion containing a solid substance comprising, based on the weight of the solid substance,

(A) from about 30 to 60%, by weight, of a polyester diol having a molecular weight of from about 500 to 6000 and wherein the diol component comprises at least about 80 mol % of hexane diol-1,6;

(B) from about 0.5 to 5.0%, by weight, of a relatively low molecular weight triol having a molecular weight of from about 92 to 399;

(C) from about 3 to 30%, by weight, of at least one mono- or poly-functional compound within the context of the isocyanate-polyaddition reaction bearing anionic groups and/or containing non-ionic polyoxyethylene segments;

(D) from about 20 to 50%, by weight, of a diisocyanate corresponding to the following general formula:



wherein R_1, R_2 and R_3, which may be the same or different, each represents hydrogen or a straight- or branched-chain aliphatic hydrocarbon radical containing from 1 to 4 carbon atoms;

(E) from about 2.5 to 20%, by weight, of other aliphatic and-/or cycloaliphatic diisocyanates; and

(F) from about 0.5 to 4%, by weight, of hydrazine.

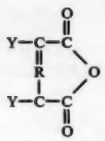
4,594,386

POLYAMIDE GRAFTED EPM BLEND

Errol J. Olivier, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Continuation-in-part of Ser. No. 522,987, Aug. 15, 1983, abandoned. This application Sep. 30, 1983, Ser. No. 537,789
Int. Cl.[4] C08L 51/00, 77/00; C08F 283/04
U.S. Cl. 525—66 15 Claims

1. A polyamide blend having improved impact strength and toughness consisting essentially of 50–98 parts by weight of the polyamide resin blended with 2–50 parts by weight of grafted and reversibly crosslinked ethylene and propylene copolymer rubber, the base rubber of which is a liquid or semi-liquid of low molecular weight having an RSV within the range of 0.4–3.0% and in which the material grafted onto the EPM is an anhydride having the general formula:



or corresponding or derivative thereof having the general formula

in which R is an alkylene group having from 1 to 4 carbon atoms, Y is selected from the group consisting of hydrogen, halogen or an organic group having from 1–12 carbon atoms and X is a hydroxyl or ester forming group but in which at least one X is hydroxyl, and in which the crosslinks will be easily disruptable in use whereby the grafted and crosslinked low molecular weight rubber comprises a solid high molecular weight material which converts to a low molecular weight in use.

4,594,387

THERMOPLASTIC RESIN COMPOSITION HAVING TOUGHNESS AND HIGH THERMAL DEFORMATION RESISTANCE

Eiichi Muramatsu, Himeji; Sigemi Mathumoto, Takasago, and Fumiya Nagoshi, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 318,108, Nov. 4, 1981, abandoned. This application Nov. 2, 1983, Ser. No. 548,069

Claims priority, application Japan, Nov. 11, 1980, 55-159133

Int. Cl.[4] C08L *25/16*

U.S. Cl. 525—67 **4 Claims**

1. A thermoplastic resin composition having toughness and high thermal deformation resistance which comprises 30 to 60 wt% of an α-methylstyrene-rich copolymer (A), 10 to 30 wt% of a vinyl graft copolymer (B), and 50 to 20 wt% of a polycarbonate (C), said copolymer (A) consisting of 65 to 90 parts by weight of α-methylstyrene and 35 to 5 parts by weight of acrylonitrile and 0 to 30 parts by weight of copolymerizable vinyl monomer, 30 parts by weight or more of said copolymer (A), based on copolymer (A), having polymer chain units with an α-methylstyrene content of 82% by weight or more based on the total amount of α-methylstyrene and other polymerizable monomers in the 30 parts by weight or more of said copolymer (A), and said graft copolymer (B) being one which is obtained by grafting at least one member of methacrylic alkyl ester, vinyl aromatic compound, and vinyl cyanide compound onto diene olefin rubber.

4,594,388

METHOD OF MANUFACTURING SHAPED ARTICLES WITH EXCELLENT HEAT RESISTANCE AND ADHESIVENESS TO RUBBER FROM A COMPOSITION COMPRISING POLYESTER AND EPOXIDIZED POLYBUTADIENE AND ADHERING SAID ARTICLES TO RUBBER

Yoshihiro Arai, Joyo, Japan, assignor to Unitika Limited, Osaka, Japan

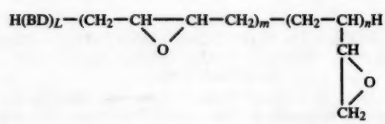
Continuation of Ser. No. 455,176, Jan. 3, 1983, abandoned. This application Aug. 30, 1984, Ser. No. 646,039

Claims priority, application Japan, Jul. 14, 1982, 57-123303

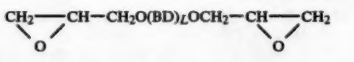
Int. Cl.[4] C08L *9/00, 15/00, 67/02*

U.S. Cl. 525—177 **7 Claims**

1. In the method of manufacturing shaped articles of polyester and adhering said articles to rubber said articles having excellent heat resistance and adhesion to rubber, the improvement comprising reacting from about 0.2 to about 5 percent by weight of an epoxidized polybutadiene which may be any of those epoxidized polybutadienes expressed by the formulas (1) and (2) below:



(1)



(2)

wherein BD in the formula means a butadiene unit which may have substituents, the microstructure of which contains one or more trans 1,4, cis 1,4 and vinyl 1,2 bonds, L is a number from 1 to 100, and m and n are numbers such that (m+n) is 1 to 50; with a polyester composed of an aromatic dicarboxylic acid and glycol ingredient with 2 to 6 carbons so that the resultant polyester has less than 15 gram equivalents of terminal carboxyl groups per 10^6 grams of polymer, such shaped articles being selected from the group consisting of film and fiber.

4,594,389

BLENDS OF HIGHER α- OLEFIN POLYMERS AND 1,2-EPOXIDE POLYMERS

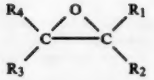
Joginder Lal, Akron, and Paul H. Sandstrom, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 416,794, Sep. 13, 1982, Pat. No. 4,478,980. This application Oct. 15, 1984, Ser. No. 660,763

Int. Cl.[4] C08L *23/20, 71/02*

U.S. Cl. 525—187 **8 Claims**

1. A rubbery composition comprising a blend of between 95/5 and 5/95 weight percent of (1) a rubbery interpolymer consisting of (a) at least 80 weight percent of at least one α-olefin containing from 5 to 10 carbon atoms and (b) up to 20 weight percent of a nonconjugated polyene containing from 5 to 30 carbon atoms with (2) a saturated polymer of an α-olefin oxide prepared from at leat one monomer having the structure:



(I)

wherein R_1 and R_2 are selected from the group consisting of hydrogen or a lower alkyl radical containing from 1 to 8 carbon atoms and R_3 and R_4 are selected from the group consisting of hydrogen, a lower alkyl radical containing from 1 to 8 carbon atoms and an alkoxyalkyl radical containing up to 12

carbon atoms, an aryl radical, a haloalkyl radical containing from 1 to 12 carbon atoms and in which R_3 and R_4 taken together may be trimethylene, or hexamethylene, thereby forming a cyclic epoxide.

4,594,390

PROCESS FOR THE PREPARATION OF THERMOPLASTIC ELASTOMERS

Sabet Abdou-Sabet, and Kuo-Shein Shen, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 23, 1982, Ser. No. 410,196
Int. Cl.[4] C08L *9/00*
U.S. Cl. 525—232 **16 Claims**

1. In a process for preparing thermoplastic elastomer composition comprising a blend of plastic and cured rubber by dynamic vulcanization, the improvement comprising masticating during dynamic vulcanization a composition comprising a blend of polypropylene and ethylene-propylene diene monomer rubber at a shear rate of at least 2000 sec^{-1}.

4,594,391

IMPACT-MODIFIED MONOVINYLIDENE AROMATIC POLYMER INJECTION MOLDING RESINS

Mary A. Jones, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 612,204, May 21, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 786,137
Int. Cl.[4] C08F *279/00, 279/02, 279/04, 2/14*
U.S. Cl. 525—316 **18 Claims**

1. An improved, impact-modified injection molding resin comprising monovinylidene aromatic polymer and a reinforcing amount of an impact improving polymer wherein the improvement comprises the monovinylidene aromatic polymer having (a) a weight average molecular weight (Mw) of from about 8.4 to 13.6 times the entanglement molecular weight of the monovinylidene aromatic polymer (EMW); (b) a ratio of Mw to number average molecular weight (Mn) greater than about 2.4; (c) less than about 10 percent by weight of the monovinylidene aromatic polymer molecules having molecular weights below about 1.3 times the entanglement molecular weight; and (d) about 34 to 42 percent by weight of the monovinylidene aromatic polymer molecules having molecular weights below about 5.2 times the EMW and further wherein the impact improving polymer is dissolved in the monomers used to prepare the monovinylidene aromatic polymer and the monomers are then polymerized in a continuous process.

4,594,392

SYNERGISTICALLY STABILIZED MIXED FORM HALOGENATED AND/OR INTERHALOGENATED RESINS FOR DISINFECTING WATER

Gary L. Hatch, Sheboygan, Wis., assignor to Ametek, Inc. - Plymouth Products Division, Sheboygana, Wis.

Continuation of Ser. No. 679,201, Dec. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 579,532, Feb. 13, 1984, abandoned. This application Nov. 1, 1985, Ser. No. 794,313
Int. Cl.[4] C08F *8/22*
U.S. Cl. 525—327.1 **6 Claims**

1. A stable, mixed form halogenated and/or interhalogenated molecular addition reaction product comprising a copolymer in the form A/B-X, wherein X includes polyvinylpyridine having the cyclic pyridyl functional ring group C_5H_5N crosslinked with about 2–25% divinylbenzene, and A/B is a combination of halogens and/or interhalogens bonded to the nitrogen atom of the pyridyl functional group of X and selected from the group consisting of I_2/ICl, I_2/IBr, I_2/Br_2, I_2/BrCl, Br_2/BrCl, Br_2/ICl, Br_2/IBr, BrCl/ICl, BrCl/IBr, ICl/IBr, and mixtures thereof, such that at least about 10% of the pyridyl functional groups are complexed by the combination A/B in proportions such that A to B is present in the molar ratio of from about 0.08 to about 0.92.

4,594,393

HALOGENATED ETHYLENE/VINYL ACETATE/ISOBUTYLENE TERPOLYMERS

Ervin G. Pritchett, and John M. Hoyt, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 29, 1984, Ser. No. 665,595
Int. Cl.[4] C08F *220/16, 8/20, 8/22*
U.S. Cl. 525—330.3 **5 Claims**

1. An ethylene-vinyl acetate polymer having improved thermal stability comprising halogenated ethylene-vinyl acetate-isobutylene terpolymers, said ethylene being present from about 15 to about 75 weight percent; isobutylene present from about 0.5 to about 15 weight percent and said vinyl acetate present from about 15 to about 50 weight percent; said halogen present from about 5 to about 25 weight percent.

4,594,394

PROCESS FOR METALATING POLYOLEFIN HALIDES

Massimo D. Bezoari, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 15, 1985, Ser. No. 711,931
Int. Cl.[4] C08F *8/42*
U.S. Cl. 525—331.5 **14 Claims**

1. A process for metalating a polyolefin halide which process comprises:

(a) forming a reaction mixture by adding a first solution of an alkyllithium compound containing from 2 to about 8 carbon atoms and an inert solvent to a second solution of a polyolefin halide and an ether-containing solvent, said compound being added in an amount sufficient to provide a molar ratio of said compound to the halogen in said polyolefin halide within the range of from about 1:10 to about 3:10; and

(b) maintaining the reaction mixture at a temperature below about −20° C. until said metalation is substantially complete.

4,594,395

PROCESS FOR METALATING HALOGENATED POLYOLEFINS

Massimo D. Bezoari, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 15, 1985, Ser. No. 711,926
Int. Cl.[4] G08F *8/42*
U.S. Cl. 525—334.1 **15 Claims**

1. A process for metalating a halogenated polyolefin, which process comprises:

(a) forming a reaction mixture by adding a first solution of an alkyllithium compound containing from about 2 to about 8 carbon atoms and an inert solvent to a second solution of a halogenated polyolefin and an ether-containing solvent, said compound being added in an amount sufficient to provide a molar ratio of said alkyllithium compound to the halogen in said halogenated polyolefin within the range of from about 0.1:1 and about 0.3:1; and

(b) maintaining the reaction mixture at a temperature below about 0° C. until said metalation is substantially complete.

4,594,396

CROSS-LINKING HALOGENATED POLYMERS

Dominick A. Berta, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 5, 1984, Ser. No. 678,729
Int. Cl.[4] C08F *8/24*; C08C *19/22*
U.S. Cl. 525—352 **8 Claims**

1. The process of cross-linking comprising heating a composition comprising at least one polymer selected from the group consisting of epichlorohydrin homopolymers, epichlorohydrin-ethylene oxide copolymers, epichlorohydrin-propylene oxide copolymers, epichlorohydrin-allylglycidyl ether copolymers, epichlorohydrin-ethylene oxide-allylglycidyl ether ter-

polymers, epichlorohydrin-propylene oxide-allylglycidyl ether terpolymers, epiflourohydrin homopolymers, epiflourohydrin-ethylene oxide copolymers, epiflourohydrin-propylene oxide copolymers, epiflourohydrin-ethylene oxide-allylglycidyl ether terpolymers, epiflourohydrin-propylene oxide-allylglycidyl ether terpolymers, poly(vinyl chloride), poly(vinyl chloride)-ethylene oxide copolymers, chloronated polyethylene, polychloroprene, chloronated butyl rubber, and brominated butyl rubber in the presence of: (1) an aliphatic substituted thiourea, (2) an inorganic base selected from the group consisting of metal oxides, hydroxides and carbonates of Groups Ia and IIa of the periodic table, and (3) a thiuram sulfide selected from the group consisting of an alkylthiuram sulfide and an arylthiuram sulfide.

4,594,397

BICYCLIC AMIDE ACETAL/POLYISOCYANATE/VINYL MONOMER DERIVED POLYMERS

Anil B. Goel, Worthington; Timothy A. Tufts, Columbus, and Peggy A. Blackburn, Plain City, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 19, 1985, Ser. No. 702,707
Int. Cl.[4] C08L *63/00*
U.S. Cl. 525—528 **15 Claims**

1. The process comprising simultaneously polymerizing a mixture of a bicyclic amide acetal, a polyisocyanate and avinyl monomer component carried out at a temperature in the range of from about 25° C. to about 200° C. wherein the equivalent ratio of bicyclic amide acetal to polyisocyanate is in the range of from about 1:0.8 to 1:3 and the vinyl monomer component varies from 1% to 99% by weight based on the other components in the mixture.

4,594,398

VINYL ESTER RESINS FROM GLYCIDYL ETHERS OF REACTION PRODUCT OF A PHENOL AND UNSATURATED HYDROCARBONS

Donald L. Nelson, and Mary J. Lamont, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 655,406, Sep. 28, 1984, abandoned. This application May 24, 1985, Ser. No. 737,593
Int. Cl.[4] C08F *283/10*
U.S. Cl. 525—531 **50 Claims**

1. A vinyl ester resin composition comprising:

(I) from about 30 to about 100 percent by weight of a vinyl ester resin prepared by reacting

(A) at least one unsaturated monocarboxylic acid;

(B) at least one epoxy resin prepared by dehydrohalogenating the reaction product of

(1) an epoxy alkyl halide and

(2) the reaction product of

(a) an aromatic hydroxyl-containing material having from one to two aromatic rings and at least one ortho or para position with respect to the hydroxyl group available for ring alkylation with

(b) at least one unsaturated hydrocarbon selected from

(i) mono- and diunsaturated hydrocarbons containing 4 to 6 carbon atoms and

(ii) unsaturated hydrocarbons containing an average of 7–55 carbon atoms per molecule; and optionally

(C) at least one dicarboxylic acid anhydride; and

(II) from about zero to about 70 percent by weight of a polymerizable ethylenically unsaturated monomer;

wherein Components (B-2-a) and (B-2-b) are employed in quantities which provides a mole ratio of (B-2-a) to (B-2-b) of from about 1.8:1 to about 30:1 and components (B-1) and (B-2) are employed in quantities which provide an epoxy group to phenolic hydroxyl group ratio of from about 1.5:1 to about 20:1, it being fully understood that the excess aromatic hydroxyl-containing material and epoxy alkyl halide are removed from the product.

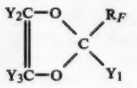
4,594,399

CYCLIC MONOMERS DERIVED FROM TRIFLUOROPYRUVATE ESTERS, AMENDED TO POLYMERS AND POLYMER FILMS FROM DIOXOLES

Burton C. Anderson; David C. England, and Paul R. Resnick, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 417,697, Sep. 13, 1982, abandoned, which is a division of Ser. No. 306,390, Sep. 28, 1981, Pat. No. 4,429,143. This application Mar. 12, 1985, Ser. No. 709,995
The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.
Int. Cl.[4] C08F *14/18*
U.S. Cl. 526—247 **10 Claims**

1. A polymer of a dioxole of the formula:



wherein Y_1, Y_2 and Y_3, independently, are F or Cl, and R_F is perfluoroalkyl of 1 to 4 carbons.

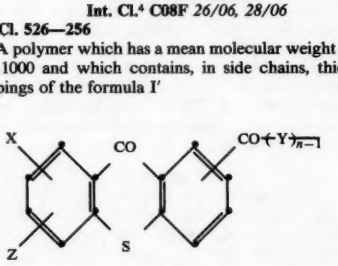
4,594,400

THIOXANTHONECARBOXYLIC ACIDS, ESTERS THIOESTERS AND AMIDES WITH REACTIVE FUNCTIONAL GROUPS AND POLYMERS PREPARED THEREFROM AND HAVING THIOXANTHONE RADICALS AS SIDE CHAINS

Vratislav Kvita, Reinach; Hans Zweifel, Basel; Martin Roth, Marly, and Louis Felder, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

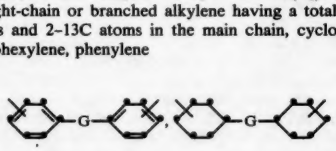
Continuation of Ser. No. 373,572, Apr. 30, 1982, abandoned, which is a division of Ser. No. 228,533, Jan. 26, 1981, Pat. No. 4,348,530. This application Sep. 19, 1984, Ser. No. 652,683
Claims priority, application Switzerland, Feb. 5, 1980, 917/80
The portion of the term of this patent subsequent to Jan. 4, 2000, has been disclaimed.
Int. Cl.[4] C08F *26/06, 28/06*
U.S. Cl. 526—256 **5 Claims**

1. A polymer which has a mean molecular weight of not less than 1000 and which contains, in side chains, thioxanthone groupings of the formula I'



(I')

in which n is the number 1 or 2, X is hydrogen, halogen, —CN, —OH, —SH, —NH_2, —NO_2, phenylsulfonyl or alkylsulfonyl, alkyl, alkoxy, alkylthio, N,N-dialkylamino or —CO-alkyl having, in each case, 1–4C atoms in the alkyl moieties, Z is hydrogen, halogen, —OH, —SH or alkyl, alkoxy, alkylthio or N,N-dialkylamino having, in each case, 1–4C atoms in the alkyl moieties, Y is —OR_1—, —SR_1— or —$N(R_2)R_1$—, R_1 is straight-chain or branched alkylene having a total of 2–23C atoms and 2–13C atoms in the main chain, cyclopentylene, cyclohexylene, phenylene



or —$(CH_2CH_2O)_x$—CH_2CH_2—, R_2 is hydrogen or straight-chain or branched alkyl having a total of 1–23C atoms and

1-13C atoms in the main chain, G is $—CH_2—$, $—CH_2CH_2—$, $—C(CH_3)_2—$, —O—, $—SO_2—$ or —NH— and x is an integer from 1 to 5, the proportion of groupings of the formula I' being not less than 2 percent, based on the number of recurring structural elements in the polymer.

4,594,401

OXYGEN PERMEABLE HARD CONTACT LENS FORMED FROM STYRENE MONOMER CONTAINING A SILYL OR SILOXANE GROUP

Kozo Takahashi, Aichi; Yasuharu Tahaka, Migumo; Kenichi Isobe, and Shoji Ichinohe, both of Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo and Toyo Contact Lens Co., Ltd., Nagoya, both of, Japan

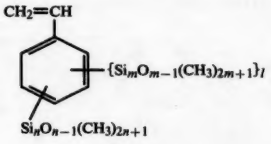
Filed Dec. 27, 1984, Ser. No. 686,876

Claims priority, application Japan, Dec. 28, 1983, 58-251106

Int. Cl.[4] C08F *30/08, 130/08, 230/08*

U.S. Cl. 526—279 **13 Claims**

1. An oxygen permeable hard contact lens made of a polymer formed from not less than about 20 parts by weight of at least one monomer, based on 100 parts by weight of the whole polymer, said at least one monomer comprising a styrene monomer containing a silyl or siloxanyl group and having the formula (I):



(I)

wherein l is 0 or 1, and n and m are integers of 1 to 15.

4,594,402

LONG CHAIN HYDROCARBON AND FLUOROCARBON REACTIVE INTERNAL RELEASE AGENTS FOR CONDENSATION POLYMERS

Charles R. Coleman, Pittsburgh, and Thomas G. Rukavina, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 376,857, May 10, 1982, abandoned. This application Jul. 17, 1985, Ser. No. 755,971

Int. Cl.[4] C08G *18/30*

U.S. Cl. 528—49 **8 Claims**

1. In a method for making a polymer article comprising the steps of;

a. casting into a mold a condensation polymerization reaction mixture of reactants containing at least two reactive functional groups;

b. polymerizing said reactants by condensation reaction to form a polymer article in the shape of said mold; and

c. releasing the condensation polymer article from said mold,

the improvement which comprises adding to said reaction mixture a long chain compound selected from the group consisting of hydrocarbons and fluorocarbons having at least one functional group which reacts with at least one reactant, said functional group so positioned on said long chain compound as to form a long carbon chain pendent from the polymer backbone in sufficient amount to improve the release of said polymer from said mold.

4,594,403

PREPARATION OF AMIDE-CONTAINING EPOXIDE/AMINE ADDUCTS

Fritz E. Kempter, Mannheim; Günther Sabelus, Lambsheim; Eberhard Schupp, Schwetzingen, and Wolfram Weiss, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 13, 1985, Ser. No. 744,206

Int. Cl.[4] C09D *3/58*

U.S. Cl. 528—113 **7 Claims**

1. A process for the preparation of an amide-containing epoxy resin/amine adduct by reacting an epoxy resin/amine adduct containing primary or secondary aminoalkyl groups or primary and secondary aminoalkyl groups with a carboxylic acid, wherein amide formation is carried out in the presence of one or more esterification catalysts.

4,594,404

POLYCARBONATES HAVING IMPROVED HYDROLYTIC STABILITY

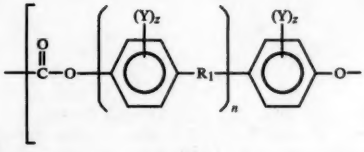
James H. Kawakami; James E. Harris, both of Piscataway; Louis M. Maresca, Belle Mead; Lloyd M. Robeson, Whitehouse Station, and Robert J. Cotter, Bernardsville, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

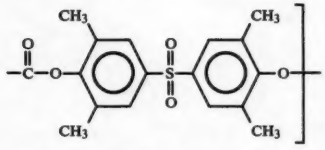
Filed Mar. 20, 1984, Ser. No. 591,539

Int. Cl.[4] C08G *63/62*

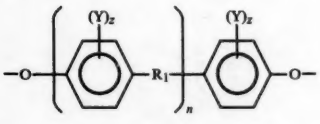
U.S. Cl. 528—174 **16 Claims**

1. A composition comprising a polycarbonate containing ordered, alternating repeating units having the formula



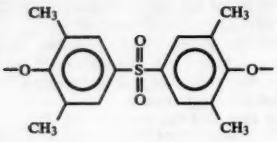


in an amount sufficient to enhance hydrolytic stability of the polycarbonate, wherein Y is selected from alkyl groups of 1 to 4 carbon atoms, chlorine or bromine, each z, independently, has a value of from 0 to 4 inclusive, n has a value of 0 or 1, R_1 is a divalent saturated or unsaturated hydrocarbon radical, O, CO, SO_2, S or a direct bonds, with the proviso that when R_1 is SO_2 then the subunit having the formula



(I)

is not the same as the subunit having the formula



(II)

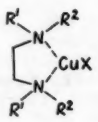
and wherein the polycarbonate has a reduced viscosity of at least about 0.3 dl/g as measured in chloroform at a concentration of 0.5 g/100 ml at 25° C.

4,594,405

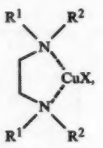
COPPER (I) COMPLEXES USEFUL AS CATALYSTS FOR POLYPHENYLENE OXIDE PREPARATION

Deborah A. Haitko, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 19, 1984, Ser. No. 572,036
Int. Cl.[4] C07F 1/08; C08G 65/38
U.S. Cl. 528—215 **18 Claims**



1. A substantially pure, crystalline copper(I)-diamine complex having the formula

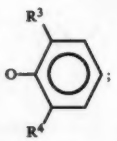


(I)

wherein:

R^1 is hydrogen or an alkyl radical and R^2 is an alkyl radical, with the provisos that (1) R^1 and R^2 taken together contain 4–6 carbon atoms and (2) when R^1 is hydrogen, R^2 is tertiary alkyl;

X is Cl or



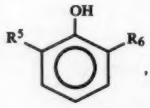
(II)

and

each of R^3 and R^4 is independently hydrogen or methyl.

2. A complex according to claim 1 wherein X has formula II.

15. A method for the preparation of a polyphenylene oxide which comprises oxidatively coupling at least one monohydroxyaromatic compound having the formula



(V)

wherein R^5 is a lower primary alkyl group and R^6 is a lower primary or secondary alkyl group, in the presence of a catalytic amount of at least one complex according to claim 2.

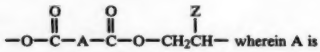
4,594,406

POLYESTERS AND THEIR MANUFACTURE FROM ACIDS AND GLYCOL CARBONATES

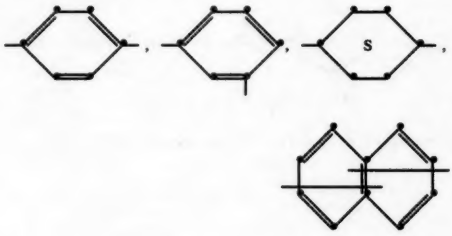
Joelle R. Thomsen, and David R. Fagerburg, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 509,532, Jun. 30, 1983, Pat. No. 4,521,585, which is a continuation-in-part of Ser. No. 405,795, Aug. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 291,609, Aug. 10, 1981, abandoned. This application Mar. 21, 1985, Ser. No. 714,243
Int. Cl.[4] C08G 63/00
U.S. Cl. 528—271 **3 Claims**

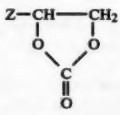
1. The process for preparing polyester of good color, an inherent viscosity (I.V.) of from about 0.4 to about 1.2 determined according to ASTM D2857-70 procedure, in a Wagner Viscometer of Lab Glass, Inc. of Vineland, New Jersey, having a ½ ml. capillary bulb, using a polymer concentration of 0.5% by weight in 60/40 by weight of phenol/tetrachloroethane, and a reacted ether-glycol level of below about 1.0% by weight, comprising preparing prepolymer of an I.V. of from about 0.008 to about 0.20 having the same or different repeating units of the formula



wherein A is

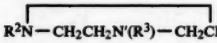


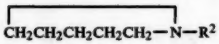
or mixture thereof in any proportion, and wherein up to about 50 mole percent of A comprises the hydrocarbon chains of 2–18 carbons of one or more aliphatic dicarboxylic acids of a modifying acid component (ADAC) consisting of one or a mixture of aliphatic dicarboxylic acids of 4–20 carbons, and Z is H or a group selected from cyclohexyl or straight or branched alkyl of 1–6 carbons, provided that the carbon of said Z group which is attached to the main chain contains at least one hydrogen atom bound to it, by reacting one or a mixture of compounds of the formula



with one or a mixture of terephthalic acid (TPA), 1,4-cyclohexanedicarboxylic acid (CHDA), isophthalic acid (IPA), or naphthalene dicarboxylic acid (NDA), and up to about 50 mole percent of said aliphatic dicarboxylic acid component (ADAC) at a temperature of from about 150° C. to about 250° C., wherein the mole ratio of the ethylene carbonate (EC) to TPA, CHDA, or NDA is from about 1 to about 2, the mole ratio EC:IPA is from about 1 to about 1.8, the ratio EC:ADAC is from about 1 to about 2, and the mole ratio of the

substituted ethylene carbonate to each of the acids is from 1.25 to 3.0 and wherein the reaction is carried out in the presence of from about 0.05 mole % to about 5.0 mole % based on total moles of carbonate reactant of an amine component selected from one or more of: trialkylamines having the formula R_3N wherein each R is an independently selectd alkyl group, linear or branched of 1 to 18 carbons: tetraalkyl nitrogen substituted diamines having the formula $R^2R^3N\text{-}R^1\text{-}NR^4R^5$ wherein R^1 is straight or branched alkylene of 1–8 carbons, and each of R^2, R^3, R^4 and R^5 is independently selected from straight or branched alkyl of 1–8 carbons:





wherein R^2 and R^3 are as defined above: quaternary ammonium salts having the formula $(R^6)_4N^+X^-$, wherein each R^6 group is independently selected from linear or branched alkyl of 1–8 carbons, or one of which is benzyl, and wherein X^- is hydroxide or a carboxylate anion, and thereafter polycondensing said prepolymer to produce said polyester.

4,594,407

PROSTHETIC DEVICES DERIVED FROM KREBS-CYCLE DICARBOXYLIC ACIDS AND DIOLS

Emery Nyilas, Austin, Tex., and Tin-Ho Chiu, Reading, Mass., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 20, 1983, Ser. No. 533,877
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—272 **4 Claims**

1. In the synthesis of a polyester which is desired for coating a vascular prosthetic device and which is formed from a Krebs-Cycle dicarboxylic acid and a metabolizable diol, the step of employing a slight excess in the range of 5 to 10 mole percent of the diol in a condensation reaction such that the formed polyester molecules are overwhelmingly terminated by the alcoholic hydroxyl groups of the diol.

4,594,408

UNSATURATED POLYESTER (AMIDE)S CONTAINING THIABICYCLONONANE GROUPS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

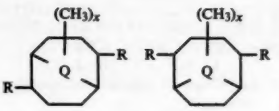
Filed Jul. 15, 1985, Ser. No. 754,700
Int. Cl.[4] C08G *63/68, 69/44*
U.S. Cl. 528—290 **8 Claims**

1. A norbornyl modified unsaturated polyester or polyesteramide resin produced by reacting under resin forming conditions

(A) an alpha, beta ethylenically unsaturated polycarboxylic acid, anhydride, or mixtures thereof,

(B) about 0.05 to about 1.2 moles of dicyclopentadiene, polycyclopentadiene or a dicyclopentadiene concentrate per mole of (A), and

(C) a polyol or a mixture of a polyol and a polyamine in a quantity sufficient to provide about 0.50 to about 1.075 moles of —OH, $—NH_2$ or $—NHR^1$ groups per mole of —COOH groups provided by (A) wherein 2 to 100 mole percent of the polyol or polyol and polyamine mixture comprises a diamino or dihydroxy thiabicyclononane or mixture thereof having one of the formulas



where x is 0 or 2, R is —OH, $—NH_2$, or $—NHR^1$, Q is S, SO, or SO_2 and R^1 is a hydrocarbyl group having from one to 20 carbon atoms.

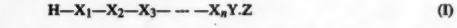
4,594,409

PRODUCING SEQUENTIAL POLYAMINO ACID RESIN

Ikuo Hayashi, Koriyama; Tadao Itikawa, Fukushima, and Kiyoshi Shimizu, Koriyama, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

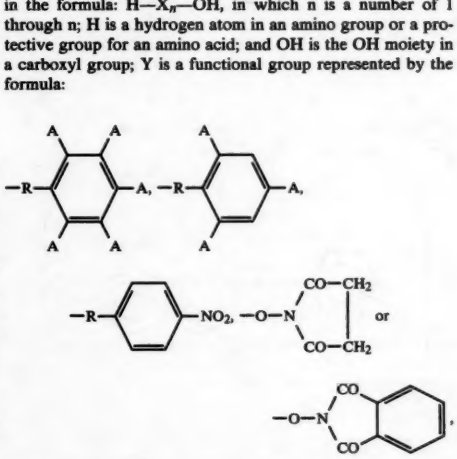
Filed Aug. 30, 1984, Ser. No. 646,317
Claims priority, application Japan, Sep. 2, 1983, 58-161650
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[4] C08G *69/10*
U.S. Cl. 528—328 **8 Claims**

1. A process for producing a sequential polyamino acid resin having a high molecular weight and special amino acid sequence as repeating unit in the resin, which comprises conducting a polycondensation reaction of a peptide active ester acid salt represented by the formula:



(I)

wherein X_1 through X_n are independently L-, D- or DL-α-amino acid residues protected or non-protected at a side chain in the formula: H—X_n—OH, in which $\bar{n}$ is a number of 1 through n; H is a hydrogen atom in an amino group or a protective group for an amino acid; and OH is the OH moiety in a carboxyl group; Y is a functional group represented by the formula:



in which A is a chlorine or bromine atom; and R is a sulfur or oxygen atom; Z is HBr, HCl, HF, CF_3COOH or p-toluenesulfonic acid; and n is an integer of 3 to 10, in an aprotic polar solvent in the presence of a catalytic amount of a tertiary amine and sufficient phosphorus pentoxide to achieve the desired degree of polymerization.

4,594,410

AZO COMPOUNDS CONTAINING BOTH SULFO GROUPS AND BASIC OR CATIONIC GROUPS WHICH COMPOUNDS ARE IN METAL-FREE OR 1:1 METAL COMPLEX FORM

Reinhard Pedrazzi, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

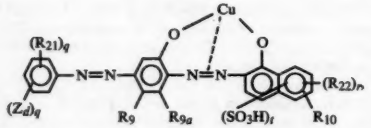
Division of Ser. No. 289,487, Aug. 3, 1981, abandoned. This application Aug. 18, 1982, Ser. No. 409,111

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030197

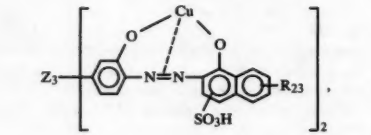
Int. Cl.[4] C09B *45/18, 45/28, 31/047, 31/12, 31/26, 31/30;* D06P *1/10*

U.S. Cl. 534—701 23 Claims

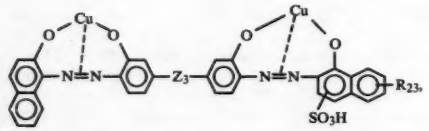
1. A metal-free compound or copper complex of the formula



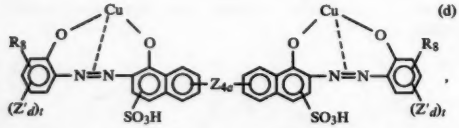
(a)



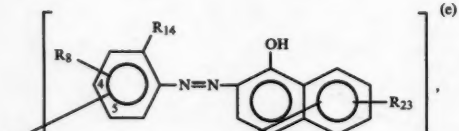
(b)



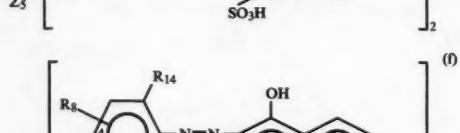
(c)



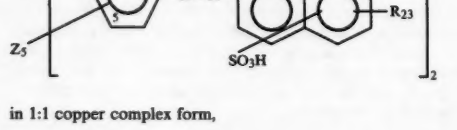
(d)



(e)

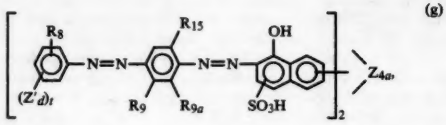


(f)

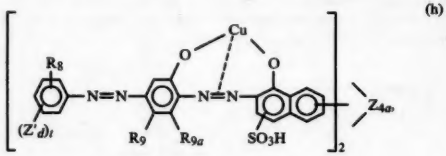


in 1:1 copper complex form,

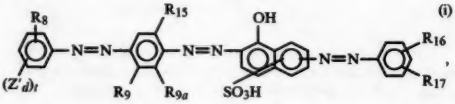
(g)



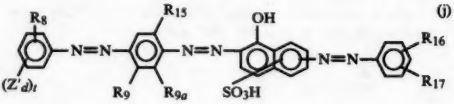
(h)



(i)

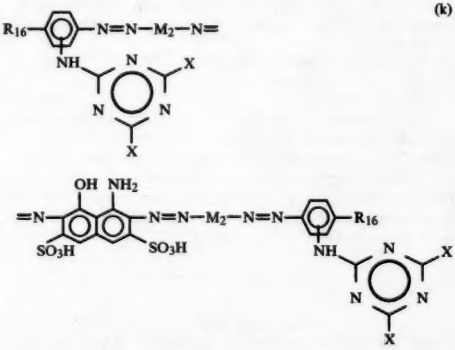


(j)



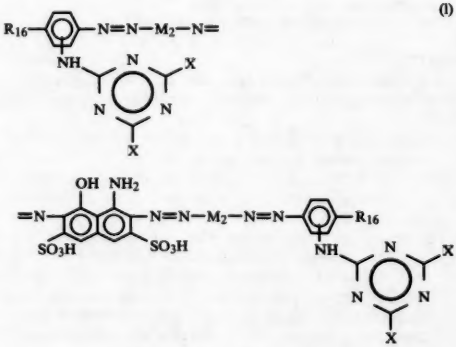
in 1:1 copper complex form,

(k)



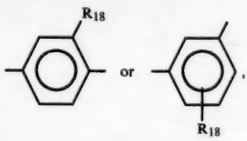
or

(l)



in 1:1 copper complex form, or an external salt thereof, wherein

each M_2 is independently



wherein R_{18} is hydrogen, chloro, methyl or methoxy,

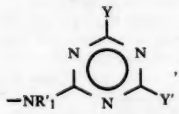
each R_8 is independently hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, fluoro, chloro, bromo, $—SO_2NR_1R_1$ or $—CONR_1R_1$, wherein each R_1 is independently hydrogen or C_{1-4}alkyl,

each R_9 is independently hydrogen, fluoro, chloro, bromo, C_{1-4}alkyl, C_{1-4}alkoxy, (C_{1-4}alkyl)carbonylamino, ureido, $—NH—CO—(CH_2)_m—N(C_{1-4}alkyl)_2$ or $—NH—CO—(CH_2)_m—N^{\oplus}(CH_3)_3$, wherein m is 1, 2 or 3, and

each R_{9a} is hydrogen or

R_9 and R_{9a} on the same ring taken together are $—CH=CH—CH=CH—$,

R_{10} is hydrogen; hydroxy; amino; (C_{1-4}alkyl)-carbonylamino; benzamido; benzamido the phenyl ring of which is substituted by 1 or 2 substituents each of which is selected from fluoro, chloro, bromo, nitro, amino, C_{1-4}alkyl and C_{1-4}alkoxy; anilino; anilino the phenyl ring of which is substituted by 1 or 2 substituents each of which is selected from fluoro, chloro, bromo, nitro, amino, C_{1-4}alkyl and C_{1-4}alkoxy; or



wherein R_1' is hydrogen or methyl,

Y is chloro; hydroxy; $—NR_{20}R_{20}$; C_{5-6}cycloalkylamino; anilino; anilino the phenyl ring of which is substituted by 1 or 2 substituents each of which is selected from fluoro, chloro, bromo, C_{1-4}alkyl, C_{1-4}alkoxy, hydroxy and phenoxy; or morpholino,

wherein each R_{20} is independently hydrogen, C_{1-4}alkyl or C_{1-4}alkyl substituted by fluoro, chloro, bromo, phenyl or hydroxy, and

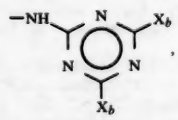
Y' is hydroxy; $—NR_{20}R_{20}$; C_{5-6}cycloalkylamino; anilino; anilino the phenyl ring of which is substituted by 1 or 2 substituents each of which is selected from fluoro, chloro, bromo, C_{1-4}alkyl, C_{1-4}alkoxy, hydroxy and phenoxy; or morpholino, wherein R_{20} is as defined above,

each R_{14} is independently hydrogen or methoxy,

each R_{15} is independently hydrogen, C_{1-4}alkyl or C_{1-4}alkoxy,

each R_{16} is independently hydroxy or amino,

R_{17} is hydroxy, amino or



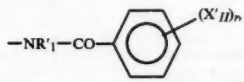
wherein X_b is as defined below,

each R_{21} is independently fluoro, chloro, bromo, C_{1-4}alkyl, C_{1-4}alkoxy, phenoxy, $—NHCO—R_{13}$, $—SO_2R_{13}$, $—SO_2NR_1R_1$ or $—CONR_1R_1$,

wherein each R_1 is independently hydrogen or C_{1-4}alkyl, and

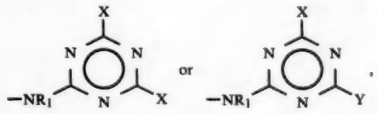
R_{13} is C_{1-4}alkyl or phenyl,

R_{22} is X_{II}' or



wherein R_1' is hydrogen or methyl,

X_{II}' is



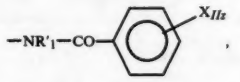
wherein R_1 is hydrogen or C_{1-4}alkyl,

X is as defined below, and

Y is as defined above, and

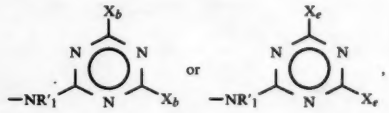
r is 0 or 1,

each R_{23} is independently X_{IIz} or



wherein R_1' is hydrogen or methyl, and

X_{IIz} is



wherein R_1' is hydrogen or methyl, and

X_b and X_e are as defined below,

each X is independently $—NR_2—Q—NR_3R_4$ or $—NR_2—Q—N^{\oplus}R_5R_6R_7$,

wherein Q is linear or branched C_{2-6}alkylene or $—NH—CO—CH_2—$,

R_2 is hydrogen or C_{1-4}alkyl,

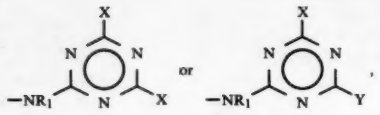
each of R_3 and R_4 is independently hydrogen; C_{1-6}alkyl; C_{2-6}alkyl monosubstituted by cyano or hydroxy in other than the 1-position; phenyl(C_{1-3}alkyl); phenyl(C_{1-3}alkyl) the phenyl ring of which is substituted by 1, 2 or 3 substituents each of which is selected from chloro, C_{1-4}alkyl and C_{1-4}alkoxy; C_{5-6}cycloalkyl or C_{5-6}cycloalkyl substituted by 1, 2 or 3 C_{1-4}alkyl groups or $—NR_3R_4$ is pyrrolidino, piperidino or morpholino,

each of R_5 and R_6 is independently C_{1-6}alkyl; C_{2-6}alkyl monosubstituted by cyano or hydroxy in other than the 1-position; phenyl(C_{1-3}alkyl); phenyl(C_{1-3}alkyl) the phenyl ring of which is substituted by 1, 2 or 3 substituents each of which is selected from chloro, C_{1-4}alkyl and C_{1-4}alkoxy; C_{5-6}cycloalkyl or C_{5-6}cycloalkyl substituted by 1, 2 or 3 C_{1-4}alkyl groups, and

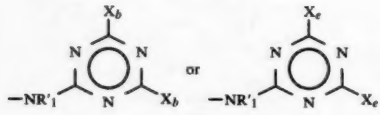
R_7 is C_{1-4}alkyl or benzyl or

$—N^{\oplus}R_5R_6R_7$ is N—R_7-pyrrolidinium, N-R_7-piperidinium, N-R_7-morpholinium, pyridinium or pyridinium substituted by 1 or 2 methyl groups, wherein R_7 is as defined above,

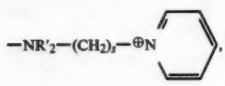
each Z_d is independently —CO—X, $—SO_2—X$ or X_{II}, wherein X_{II} is



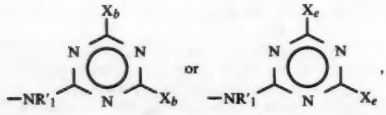
wherein R_1 is hydrogen or C_{1-4}alkyl, and
X and Y are as defined above, and
X is as defined above, with the proviso that when a Z_d is X_{II}, the ring to which it is attached contains only one Z_d group,
each Z_d' is independently —CO—X_a, —SO_2—X_a, —CO—X_e,



wherein R_1' is hydrogen or methyl,
X_a is —NR_2'—Q—$NR_3'R_4'$,
wherein R_2' is hydrogen or methyl,
each of R_3' and R_4' is independently hydrogen, C_{1-6}alkyl, 2-hydroxyethyl, 2- or 3-hydroxy-n-propyl or benzyl or —$NR_3'R_4'$ is pyrrolidino, piperidino or morpholino, and
Q is as defined above,
each X_b is independently —NR_2'—Q'—$NR_3''R_4''$,
wherein Q' is linear or branched C_{2-6}alkylene,
R_2' is hydrogen or methyl, and
each of R_3'' and R_4'' is independently hydrogen, C_{1-4}alkyl or 2-hydroxyethyl or
—$NR_3''R_4''$ is piperidino or morpholino, and
each X_e is independently —NR_2'—$(CH_2)_s$—$N^{\oplus}(CH_3)_3$ or

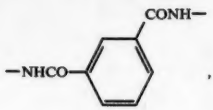


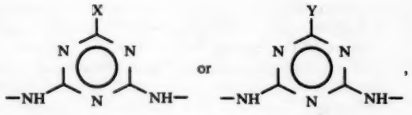
wherein R_2' is hydrogen or methyl, and
s is 2 or 3, with the proviso that when a Z_d' is



the ring to which it is attached contains only one Z_d' group and otherwise it contains two Z_d' groups,
Z_3 is a direct bond, —$(CH_2)_m$—, —CH=CH—,

—P—, —NH—, —S—, —SO_2—, —NHCO—, —O—$(CH_2)_s$—O—, —NHCONH—, —NH-CO—$(CH_2)_s$—CONH— or —CONH—$(CH_2)_s$—NH-CO—,
wherein m is 1, 2 or 3, and s is 2 or 3,
Z_{4a} is —NH—, —NHCONH—, —NHCOCH_2CH-$_2$CONH—, —NHCO—CH=CH—CONH—,





wherein X and Y are as defined above,
Z_5 is —N=N— or

with the proviso that each end of Z_5 is independently in the 4- or 5-position of the phenyl ring to which it is attached,
each q is independently 0, 1 or 2,
each r is independently 0 or 1, and
each t is independently 1 or 2,
with the provisos that (i) the number of basic and cationic groups together exceeds the number of sulfo groups, (ii) each basic group is independently in free base, internal salt or external acid addition salt form, (iii) the positive charge of each cationic group is independently balanced by the negative charge of a —$SO_3^{\ominus}$ group of the molecule or by $A^{\ominus}$, where $A^{\ominus}$ is an external non-chromophoric anion, and (iv) the number of basic groups in internal salt form and cationic groups the positive charge of which is balanced by the negative charge of a —$SO_3^{\ominus}$ group of the molecule does not exceed the number of sulfo groups present in the molecule.

4,594,411

SULFONATED MONOAZO COLORANT LAKE OBTAINED BY DI-AZO COUPLING OF 5-ACETYLAMINO-2-AMINOBENZENE-1-SULFONIC ACID WITH 1-(3'-SULFOPHENYL)-3-METHYLPHYRAZOL-5-ONE

Georg Henning, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

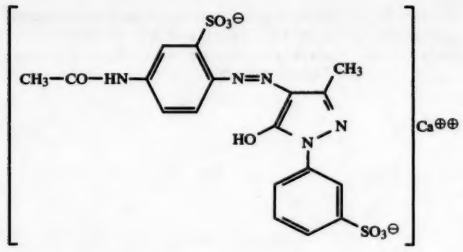
Division of Ser. No. 546,164, Oct., 1983, abandoned, which is a division of Ser. No. 403,152, Jul., 1982, abandoned. This application Jun. 6, 1984, Ser. No. 617,155

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1981, 3133404

Int. Cl.[4] **C09B** *29/03, 29/10, 29/36;* **D06P** *1/39*

U.S. Cl. 534—784 **1 Claim**

1. An azo colorant lake of the formula:



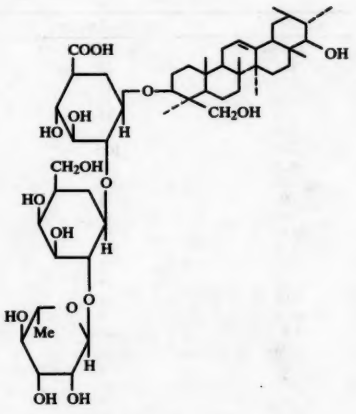
4,594,412

METHOD OF ISOLATING SOYASAPONINS

Isao Kitagawa, Toyonaka, Japan, assignor to Osaka Chemical Laboratory Co., Ltd., Osaka, Japan

Filed Jan. 6, 1984, Ser. No. 568,714
Claims priority, application Japan, Mar. 23, 1983, 58-49359
Int. Cl.[4] C07H *1/08*
U.S. Cl. 536—18.5 13 Claims

1. A method of isolating soyasponin I which comprises using the whole plant or the seed of a plant belonging to *Medicago sativa Linn., Trifolium pratense Linn., Trifolium repens Linn., Astragalus sinicus Linn.* and *Vicia sativa Linn.*, treating said whole plant or seed with water, an organic solvent miscible with water or a mixture of such organic solvent and water to obtain an extract and isolating soyasaponin I a compound having the formula



from the obtained extract.

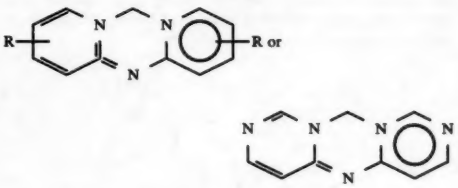
4,594,413

PREPARATION OF N,N'-METHYLENE-2,2'-AZOPYRIDOCYANINES

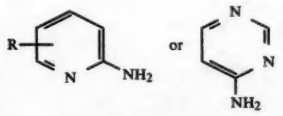
Shekhar Munavalli, and Edward J. Poziomek, both of Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 13, 1985, Ser. No. 765,286
Int. Cl.[4] C07D *251/72, 471/14, 487/14*
U.S. Cl. 544—180 7 Claims

1. A process for producing N,N'-methylene-2,2'-azapyridocyanines represented by the formulas



or the halide quaternary salts thereof, which comprises reacting a compound represented by the formulas



wherein R is hydrogen or lower alkyl, with the proviso that R at the 6-position of the aminopyridine must be hydrogen, with a methylene halide represented by the formula CH_2X_2 wherein X is halogen, under reflux in the presence of a dry, inert organic solvent for a time sufficient to complete the reaction.

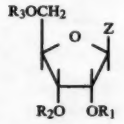
4,594,414

2-β-D-RIBOFURANOSYLSELENAZOLE-4-CARBOXAMIDE COMPOUNDS AND METHODS FOR THEIR PRODUCTION

Roland K. Robins, Provo, Utah, and Prem C. Srivastava, Oak Ridge, Tenn., assignors to Brigham Young University, Provo, Utah

Division of Ser. No. 465,221, Feb. 15, 1983, Pat. No. 4,531,001, which is a continuation-in-part of Ser. No. 360,968, Mar. 23, 1982, abandoned. This application Jun. 22, 1984, Ser. No. 612,267
Int. Cl.[4] C07H *5/04*
U.S. Cl. 536—18.7 4 Claims

1. A compound of the structure II:



II

wherein R_1, R_2 and R_3 are acyl selected from the group consisting of benzoyl and C_1 to C_{18} acyl; and Z is $—C(NH_2)Se$.

4,594,415

AZOLE DINUCLEOTIDE COMPOSITIONS AND METHODS OF USE

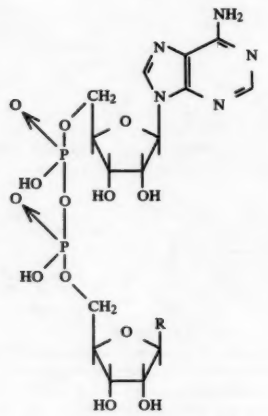
Roland K. Robins, 4006 Sherwood, Provo, Utah 84604, and Ganapathi R. Revankar, 1003 N. 560 East St., Orem, Utah 84057

Continuation of Ser. No. 363,315, Mar. 29, 1982, Pat. No. 4,544,741. This application Dec. 24, 1984, Ser. No. 685,999

Int. Cl.[4] C07H *15/12, 17/00*

U.S. Cl. 536—27 **4 Claims**

1. A pharmaceutical composition for the treatment of vaccinia virus infection or vesicular stomatitis virus infection comprising an antiviral effective amount of an azolecarboxamide adenosine dinucleotide compound having the structural formula:



or a pharmaceutically acceptable salt of the compound; wherein R is a heterocycle that is 3-carbamoyl-1,2,4-triazol-1-yl or 4-carbamoylselenazol-2-yl and a pharmaceutically acceptable carrier.

4,594,416

2-β-D-RIBOFURANOSYLSELENAZOLE-4-CARBOXAMIDE COMPOUNDS AND METHODS FOR THEIR PRODUCTION

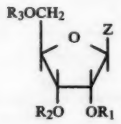
Roland K. Robins, Provo, Utah, and Prem C. Srivastava, Oak Ridge, Tenn., assignors to Brigham Young University, Provo, Utah

Division of Ser. No. 465,221, Feb. 15, 1983, Pat. No. 4,531,001, which is a continuation-in-part of Ser. No. 360,968, Mar. 23, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 612,078

Int. Cl.[4] C07H *5/00*

U.S. Cl. 536—121 **4 Claims**

1. A compound of the structure II:



II

wherein R_1, R_2 and R_3 are acyl selected from the group consisting of benzoyl and C_1–C_8 acyl; and Z is selenazol-4-alkyl carboxylate-2-yl, alkyl being selected from the group consisting of lower alkyl and lower aralkyl.

4,594,417

CRYSTALLINE ANTIBIOTIC SALT

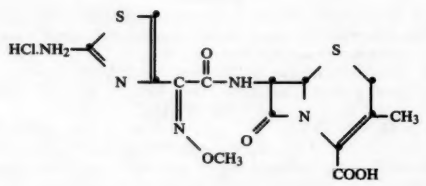
Kuo S. Yang, Greenwood, Ind., assignor to Eli Lilly Company, Indianapolis, Ind.

Continuation of Ser. No. 497,329, May 23, 1983, abandoned, which is a division of Ser. No. 316,615, Oct. 3, 1984, Pat. No. 4,400,503. This application Dec. 3, 1984, Ser. No. 677,122

Int. Cl.[4] C07D *501/12*

U.S. Cl. 544—28 **1 Claim**

1. The crystalline hydrochloride salt of the formula:

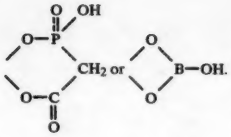


wherein the oxime is in the syn configuration, which has the following X-ray powder diffraction pattern (Cu^{++} radiation, 1.5418Å, nickel filter, d=interplanar spacing in angstrom) when crystallized from formamide-water:

d	Relative Intensity
13.56	25
8.61	25
7.78	75
6.88	45
5.80	15
5.13	7
4.42	100
4.29	35
4.10	55
3.98	35
3.87	40
3.64	35
3.47	60
3.16	62
3.07	18
3.00	15
2.91	15
2.80	18
2.74	22
2.60	12
2.50	20
2.45	20
2.39	15
2.23	15

-continued

d	Relative Intensity
2.15	15
2.12	15
2.00	20



4,594,418

ANTITUMOR PLATINUM COMPLEXES

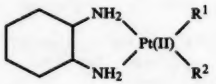
Robert J. Speer, Richardson, and David P. Stewart, Fort Worth, both of Tex., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 592,987, Mar. 23, 1984, Pat. No. 4,562,275. This application Sep. 30, 1985, Ser. No. 781,629

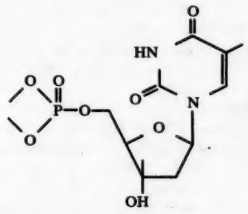
Int. Cl.[4] C07F *15/00*

U.S. Cl. 544—225 6 Claims

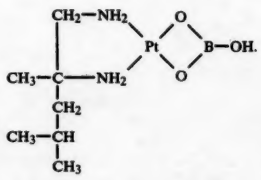
1. A compound of the formula



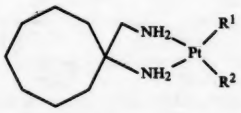
wherein the stereoisomerism of 1,2-diaminocyclohexane is cis-, trans(+) or trans(−) and R^1 and R^2 when taken together represent a group of the formula



3. The compound having the formula



4. A compound having the formula



wherein R^1 and R^2 when taken together represent

4,594,419

SUBSTITUTED 5-PHENYLTHIO-6-AMINO-PYRIMIDINONES, A PROCESS FOR THEIR PREPARATION AND THEIR USE, AND FORMULATIONS CONTAINING THESE COMPOUNDS

Erich Cohnen, Jork, and Ben Armah, Hamburg, both of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

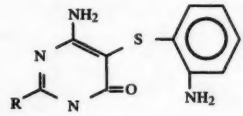
Filed Jun. 13, 1983, Ser. No. 503,469

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222914

Int. Cl.[4] C07D *239/10*

U.S. Cl. 544—311 2 Claims

1. A substituted 5-phenylthio-6-amino-pyrimidinone of the formula



in which R denotes a hydroxyl group, and its tautomers and acid addition salts.

4,594,420

PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID MONOANHYDRIDE MONOIMIDE AND MONOIMIDAZOLIDE COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Ernst Spietschka, Idstein/Taunus, and Helmut Tröster, Königstein/Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

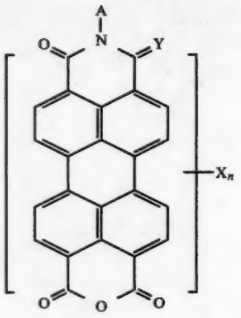
Filed Mar. 12, 1984, Ser. No. 588,541

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1983, 3309060

Int. Cl.[4] C07D *491/06;* C09B *5/62*

U.S. Cl. 546—29 7 Claims

1. A perylene-3,4,9,10-tetracarboxylic acid monoanhydride monoimide compound of the formula (I)



with the following meanings:

wherein X represents chlorine or bromine,

n denotes an integer from 0 to 4,

Y represents an oxygen atom or a nitrogen atom being part of a benzimidazole ring, A, if Y represents an oxygen atom, denotes phenyl being non-substituted or substituted by 1 to 3 members of the group consisting of alkyl$_{C1\text{-}C4}$, alkoxy$_{C1\text{-}C4}$, hydroxyl, trifluoromethyl and halogen or one member of the group consisting of nitro, phenoxy, phenylamino, phenylazo and pyridyl, or A, if Y represents a nitrogen atom, is the orthophenylene radical which together with the two nitrogen atoms forms the benzimidazole ring, the benzene nucleus of which being non-substituted or substituted by 1 to 2 members of the group consisting of chlorine, alkyl$_{C1\text{-}C4}$ and alkoxy$_{C1\text{-}C4}$.

4,594,421

IMIDAZOPYRIDINE COMPOUNDS

Piero Bellani; Gaetano Clavenna; Alberta Sosio, all of Milan, and Rinaldo Pellegrini, Carbonera, all of Italy, assignors to RBS Pharma (Roger Bellon Schoum) S.p.A., Milan, Italy

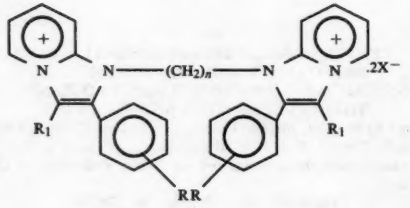
Filed Jan. 31, 1985, Ser. No. 696,589

Claims priority, application Italy, Feb. 2, 1984, 19413 A/84

Int. Cl.[4] C07D *487/04*

U.S. Cl. 546—121 **5 Claims**

1. An imidazopyridine derivative of structural formula:



wherein R represents a hydrogen atom, an alkyl radical of 1 to 3 carbon atoms, a methoxy group or a halogen atom,

R_1 represents a hydrogen atom, an alkyl atom of 1 to 3 carbon atoms,

n represents an integer 1 to 10,

X represents a non-toxic pharmaceutically acceptable ion.

4,594,422

SELECTIVE HALOGENATION OF 6-HYDROXY PICOLINE DERIVATIVES

Jon A. Orvik, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 11, 1985, Ser. No. 710,262

Int. Cl.[4] C07D *211/84*

U.S. Cl. 546—303 **8 Claims**

1. A process for selective halogenation of a 6-hydroxy picoline derivative in the 3-position comprising:

Allowing a 6-halo picoline derivative selected from the group consisting of 6-halo picolinic acid and 6-halo picoline to stand in an aqueous mineral acid solution for a sufficient period to replace the halo substituent with a hydroxy substituent, and halogenating the aqueous mineral acid solution of said 6-hydroxy picoline derivative to obtain the corresponding 3-halo 6-hydroxy picoline product.

4,594,423

SEPARATION OF PICOLINE ISOMERS

Hermann A. Zinnen, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 16, 1984, Ser. No. 631,668

Int. Cl.[4] C07B *63/00*

U.S. Cl. 546—353 **19 Claims**

1. A process for separating alpha-picoline from a feed mixture comprising alpha-picoline and at least one other isomer of picoline, which comprises contacting said mixture at adsorption conditions with an adsorbent comprising a type Y zeolite having alkaline earth or iron group cations at exchangeable cationic sites, selectively adsorbing said other isomer to the substantial exclusion of the alpha isomer, and recovering high purity alpha-picoline as a raffinate stream.

11. A process for separating gamma-picoline from a feed mixture comprising gamma-picoline and at least one other isomer of picoline, which comprises contacting said mixture at adsorption conditions with an adsorbent comprising a type X zeolite having potassium cations at exchangeable cationic sites, or a type Y zeolite having calcium cations at exchangeable cationic sites, selectively adsorbing said gamma isomer to the substantial exclusion of the remaining isomers, removing said remaining isomers from contact with said adsorbent, and thereafter recovering high purity gamma-picoline.

4,594,424

5-MERCAPTO-1,2,3-THIADIAZOLES COMPOSITION AND PROCESS FOR PREPARING THE SAME

Fumio Iwata; Takato Nakamura, and Tadakazu Sakata, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Jul. 10, 1984, Ser. No. 629,360

Claims priority, application Japan, Jul. 12, 1983, 58-125592

Int. Cl.[4] C07D *285/06*

U.S. Cl. 548—127 **19 Claims**

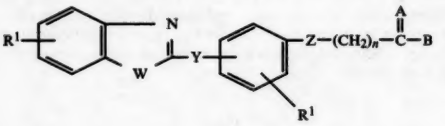
1. A 5-mercapto-1,2,3-thiadiazoles composition consisting essentially of a 5-mercapto-1,2,3-thiadiazole combined with (A) one or more compounds selected from the group consisting of water, an alcohol, an aromatic hydrocarbon and a halogenated hydrocarbon and (B) a halide of an alkali metal; the content of said compound (A) is 5 to 25% by weight and the content of said compound (B) is 10 to 30% by weight of said composition.

4,594,425
HETEROCYCLIC COMPOUNDS AS ANTIALLERGIC AGENTS

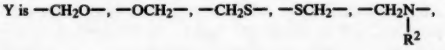
John H. Musser, Malvern, and Dennis M. Kubrak, Drexel Hill, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

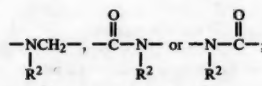
Filed Feb. 9, 1984, Ser. No. 578,444
Int. Cl.[4] C07D *277/82, 263/58;* **A61K** *31/425, 31/42*
U.S. Cl. 548—161 **9 Claims**

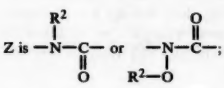
1. A compound having the formula



wherein:







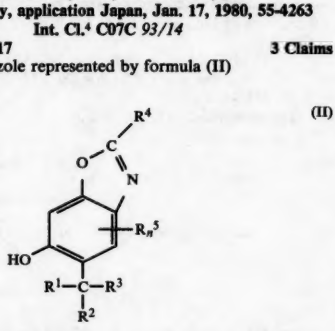
n is 0–6;
A is O or S;
B is OR^2, SR^2 or $N(R^2)_2$;
R^1 is hydrogen, loweralkyl, loweralkoxy or halo;
R^2 is hydrogen or loweralkyl;
and the pharmaceutically acceptable salts thereof.

4,594,426
BENZOXAZOLE DERIVATIVE INTERMEDIATES FOR SYNTHESIS OF DYE RELEASING REDOX COMPOUNDS

Shinsaku Fujita; Koichi Koyama, and Yoshio Inagaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 16, 1981, Ser. No. 225,820
Claims priority, application Japan, Jan. 17, 1980, 55-4263
Int. Cl.[4] C07C *93/14*
U.S. Cl. 548—217 **3 Claims**

1. A benzoxazole represented by formula (II)



(II)

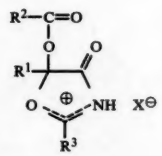
wherein R^1 and R^2 may be the same as or different from each other, and each represents an alkyl group of 1–24 C atoms, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, or may combine to form a 5 to 20 membered ring; R^3 represents a hydrogen atom, an alkyl group of 1–24 C atoms, a substituted or unsubstituted phenyl group or a substituted or unsubstituted naphthyl group; R^4 represents an alkyl group of 1–40 C atoms; R^5 represents an alkyl group of 1–40 C atoms, an alkoxy group, or an alkylthio group wherein the alkyl moiety of said alkoxy or alkylthio group is 1–40 C atoms, a substituted or unsubstituted phenylthio group or a 1-phenyl-5-tetrazoyl-thio group, a halogen atom or an alkyl-CONH-group in which the alkyl moiety has from 1–24 C atoms, or a substituted or unsubstituted phenyl-CONH group, and n is 0, 1, or 2; the substituents of the substituted group of R, R^2, R^3 and R^5 being an alkoxy group, a cyano group, a hydroxy group, a nitro group, or an alkyl group, said benzoxazole derivative being useful as an intermediate for synthesis of an o-sulfanamidophenol derivative which acts as a dye releasing redox compound and provides a transferred dye image having high optical density when used in a diffusion transfer process.

4,594,427
PREPARATION OF NOVEL 5-ACYLOXY-4-(5H)-OXAZOLONIUM SALTS SUITED FOR USE AS INTERMEDIATES FOR TRIAZINONE HERBICIDES

Gerhard Bonse; Gerhard Marzolph, both of Cologne, and Heinz U. Blank, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,495
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1981, 3115970
Int. Cl.[4] C07D *413/04, 263/08, 285/08*
U.S. Cl. 548—226 **4 Claims**

1. An acidic solution of a 5-acyloxy-4(5H)-oxazolonium salt of the formula



in which
R^1 represents a straight-chain or branched alkyl group with 1 to 4 carbon atoms optionally substituted by alkoxy with 1 to 4 carbon atoms, carbalkoxy with 1 to 4 carbon atoms in the alkoxy part, nitro, nitrile and/or halogen; represents a cycloalkyl group with 3 to 6 carbon atoms in the ring system which is optionally substituted by alkyl, alkoxy or carbalkoxy, each with up to 4 carbon atoms, nitro, nitrile and/or halogen; represents a phenyl or naphthyl group which is optionally substituted by alkyl, alkoxy or carbalkoxy, each with up to 4 carbon atoms, nitro and/or halogen; or represents a morpholinyl, imidazolyl, pyrazolyl, pyrrolyl, isoxazolyl, piperidinyl, oxazolyl, 1,2,4-triazol-1-yl, 1,2,4-triazol-4-yl, 1,2,3-triazolyl, 1,2,4-thiadiazol-2-yl, benzimidazolyl, or furanyl ring which is optionally substituted by alkyl, alkoxy or carbalkoxy, each with up to 4 carbon atoms, nitro, nitrile and/or halogen;
R^2 and R^3 represent an optionally chlorine-substituted alkyl group with 1 to 4 carbon atoms or a phenyl group, and
X^- represents the anion of an inorganic or organic acid having a pK_a value of less than about 2.

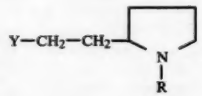
4,594,428

NOVEL SUBSTITUTED HETEROCYCLIC AMINES AND METHODS OF PREPARATION THEREOF

Michel L. Thominet, Paris, and Jacqueline F. Franceschini, L'Hay les Roses, both of France, assignors to Societe d'Etudes Scientifiques et Industrielles de L'ile-de-France, Paris, France

Division of Ser. No. 162,796, Jun. 25, 1980, Pat. No. 4,379,161.
This application Jan. 7, 1983, Ser. No. 456,523
Int. Cl.[4] C07D *207/08, 207/04*
U.S. Cl. 548—570 3 Claims

1. A compound of the formula



wherein Y is hydroxyl or chlorine and R is 1-cyclohexenylmethyl.

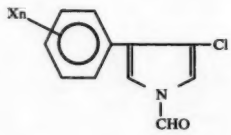
4,594,429

PROCESS FOR PRODUCING THE 3-CHLORO-1-FORMYL-4-PHENYLPYRROLES

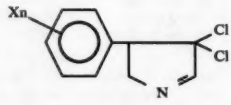
Akiyoshi Ueda; Fumihiko Nagasaki; Yutaka Takakura, and Shigeru Kojima, all of Kanagawa, Japan, assignors to Nippon Soda Co. Ltd., Tokyo, Japan

PCT No. PCT/JP83/00371, § 371 Date Jun. 4, 1984, § 102(e) Date Jun. 4, 1984, PCT Pub. No. WO84/01773, PCT Pub. Date May 10, 1984
PCT Filed Oct. 21, 1983, Ser. No. 619,158
Claims priority, application Japan, Oct. 28, 1982, 57-188191; Oct. 28, 1982, 57-188192
Int. Cl.[4] C07D *207/30*
U.S. Cl. 548—530 2 Claims

1. A process for producing a compound represented by the general formula:



by reacting a pyrroline derivative having the general formula:



with an addition product consisting of a formamide derivative selected from the group consisting of N,N-dimethylformamide, N-formyl-morpholine and N-methylformamide and a material selected from the group consisting of thionyl chloride, phosphorous oxychloride, oxalyl chloride, phosgene and mixtures thereof at a temperature of between about 70° C. and about 125° C., then hydrolysing the resulting reaction compound at a temperature between about 5° C. and about 100° C., in a solution selected from the group consisting of an aqueous solution and an alkaline solution and obtaining above formulated compound, wherein X denotes substituent(s) selected from the group consisting of halo, nitro and trifluoro methyl and n denotes zero or an integer of 1 or 2.

4,594,430

SYNTHESIS OF GEMINAL DINITRO COMPOUNDS

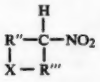
Vytautas Grakauskas, Arcadia; Lee C. Garver, and Kurt Baum, both of Pasadena, all of Calif., assignors to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 31, 1985, Ser. No. 696,680
Int. Cl.[4] C07D *305/08, 333/42;* C07C *79/04, 79/08*
U.S. Cl. 549—9 8 Claims

1. A process for producing a geminal dinitro compound which comprises reacting a nitrite salt selected from the group consisting of alkali metal nitrites and alkaline earth metal nitrites with an organic nitro compound having a replaceable hydrogen atom attached to the carbon atom to which the nitro group is attached, said organic nitro compound having the general formula

wherein R and R′ are selected from the group consisting of hydrogen, C1 to C4 alkyl, C2 to C6 alkyl ether, C2 to C4 carboxylic acid, C3 to C6 carboxylic acid ester, C6 to C9 cycloalkyl, C7 to C9 alkaryl and C7 to C9 aralkyl, in the presence of an alkali metal persulfate and about 0.05 to about 0.50 moles of an alkali metal ferricyanide per mole of said organic nitro compound.

2. A process for producing a geminal dinitro compound which comprises reacting a nitrite salt selected from the group consisting of alkali metal nitrites and alkaline earth metal nitrites with an organic nitro compound having a replaceable hydrogen atom attached to the carbon atom to which the nitro group is attached, said organic nitro compound having the general formula



wherein X is selected from the group consisting of O and S, and wherein R″ and R‴ are C1 to C3 alkylene, in the presence of an alkali metal persulfate and about 0.05 to 0.50 moles of an alkali metal ferricyanide per mole of said organic nitro compound.

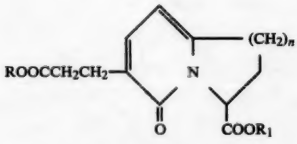
4,594,431

OCTAHYDROINDOLIZINEPROPANOIC ACIDS AND RELATED COMPOUNDS AS ENZYME INHIBITORS

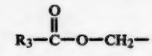
Jon S. Mynderse, Indianapolis, and David S. Fukuda, Brownsburg, both of Ind., assignors to Eli Lilly Company, Indianapolis, Ind.

Filed Aug. 1, 1983, Ser. No. 519,360
Int. Cl.[4] C07D *209/00, 221/00*
U.S. Cl. 546—138 4 Claims

1. The compound of the formula



wherein n is 1 or 2; R and R_1 independently are hydrogen, C_1–C_6 alkyl, indanyl, phthalidyl, or an acyloxymethyl group of the formula



wherein R_3 is C_1–C_4 alkyl, phenyl, halophenyl, C_1–C_4 alkylphenyl, C_1–C_4 alkoxyphenyl, or 3,4-methylenedioxyphenyl; and when either or both of R and R_1 is or are hydrogen, and the pharmaceutically acceptable non-toxic salts thereof.

4,594,432

PROCESS FOR THE SYNTHESIS OF 1α,23(S),25-TRIHYDROXYCHOLECALCIFEROL AND 1α,23(R),25-TRIHYDROXYCHOLECALCIFEROL

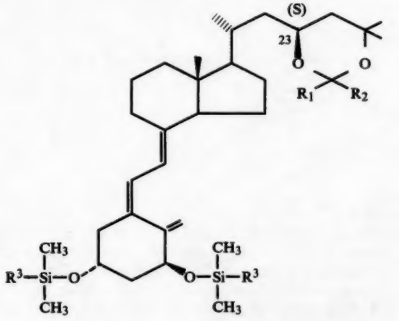
Enrico G. Baggiolini, North Caldwell; Milan R. Uskokovic, Upper Montclair, and Peter M. Wovkulich, Nutley, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 461,836, Jan. 28, 1983, abandoned. This application Dec. 27, 1983, Ser. No. 566,103

Int. Cl.[4] C07D *319/06, 303/12;* **C07F** *7/04;* **C07C** *35/22*

U.S. Cl. 549—214 **22 Claims**

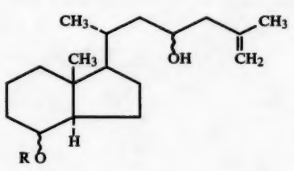
1. A compound of the formula



wherein R_1 and R_2 each independently are lower alkyl.

7. A compound of the formula

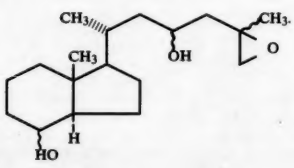
VII-A



wherein R^4 is tri-lower alkylsilyl, di-lower alkylarylsilyl, lower alkyldiarylsilyl, triarylsilyl.

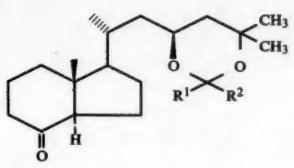
10. A compound of the formula

IX



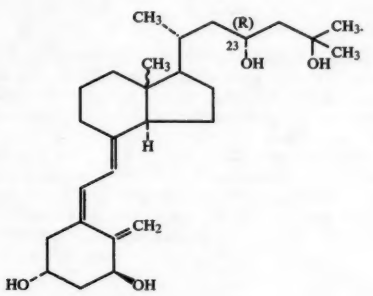
19. A compound of the formula

II



wherein R^1 and R^2 each independently is hydrogen, lower alkyl or aryl or taken together are lower alkylene of from 3 to 6 carbon atoms.

22. A compound of the formula



4,594,433

PRODUCTION OF MALEIC ANHYDRIDE

George D. Suciu, Ridgewood, N.J.; Giancarlo Stefani, and Carlo Fumagalli, both of Bergamo, Italy, assignors to Lummus Crest, Inc., Bloomfield, N.J. and Alusuisse Italia S.p.A., Milan, Italy

Division of Ser. No. 523,931, Aug. 17, 1983, Pat. No. 4,510,258. This application Dec. 10, 1984, Ser. No. 680,757

Int. Cl.[4] C07D *307/60*

U.S. Cl. 549—256 **19 Claims**

1. In a process for oxidizing a hydrocarbon to maleic anhydride by contact with molecular oxygen in the presence of a catalyst, the improvement comprising:

employing in said oxidizing a catalyst comprising mixed oxides of vanadium and phosphorus, said catalyst having a phosphorus to vanadium ratio of from 1:1 to 2:1, said catalyst having been pretreated by contacting a dried catalyst precursor comprising mixed oxides of vanadium and phosphorus, in finely divided form, with an acid solution and drying of the acid treated particles to produce a dry catalyst.

4,594,434

PROCESS FOR THE DEPOLYMERIZATION OF POLYESTERS USING DAWSONITE AS THE CATALYST

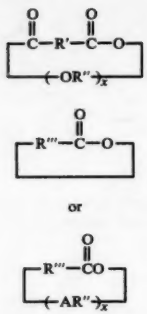
Joseph Cahill, Jr., Ft. Mitchell, Ky., and Eugene G. Harris, West Chester, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 404,158, Aug. 2, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 668,597

Int. Cl.[4] C07D *323/00, 313/00, 327/00, 327/02*

U.S. Cl. 549—267 **5 Claims**

1. A process for the production of macrocyclic compounds having 8 to 20 carbon atoms in the ring and having the general formula



where R′ is a bivalent aliphatic hydrocarbon radical having from 1 to 16 carbon atoms, R″ is a saturated bivalent aliphatic hydrocarbon radical having from 2 to 12 carbon atoms, R‴ is a bivalent aliphatic hydrocarbon radical having from 6 to 18 carbon atoms, x is an integer from 1 to 4, and A is oxygen or sulfur, which comprises heating the corresponding linear polyester at a temperature from 200° C. to 400° C. and pressure less than 50 mm Hg in the presence of 0.01 to 10% by weight, Dawsonite based on the polyester, to thermally depolymerize the polyester and removing the macrocyclic product formed.

4,594,435

INTERMEDIATES FOR 2′-SUBSTITUTED-SPIRO[BENZOFURAN-2(3H),1′-CYCLOALKANES]

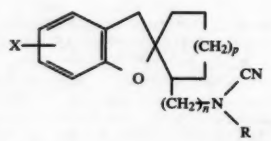
Edward J. Glamkowski, Warren, N.J., and Michael C. Jones, deceased, late of Montague, Mich. (by Herbert Jones, administrator), assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 416,446, Sep. 13, 1982, Pat. No. 4,517,311. This application Feb. 28, 1985, Ser. No. 706,824

Int. Cl.⁴ C07D *307/94*

U.S. Cl. 549—345 **2 Claims**

1. A compound having the structural formula



wherein X is hydrogen, halogen and alkyl of 1–3 carbons, halogen being any of fluorine, chlorine, bromine and iodine; n is an integer of 0, 1 or 2; p is an integer of 0 or 2 and R is methyl, ethyl or n-propyl; and a stereoisomer thereof.

4,594,436

ISOMERIC 2-CHLOROMETHYL-1,4-BENZODIAZEPINE OR 3-CHLORO-1,5-BENZODIAZOCINE COMPOUND

Hans Liepmann; Michael Ruhland, both of Hanover; Herbert Muesch, Wennigsen; Werner Benson, Hanover; Henning Heinemann, Hanover, and Horst Zeugner, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 453,785, Dec. 27, 1982, Pat. No. 4,508,716. This application Mar. 1, 1985, Ser. No. 707,037

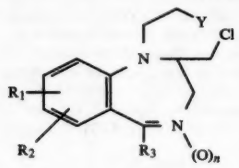
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151597

Int. Cl.⁴ C07D *319/08, 487/04, 498/04;* **A61K** *31/495*

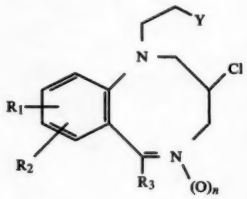
U.S. Cl. 549—359 **1 Claim**

1. A compound coresponding to the formula II or III

II



III

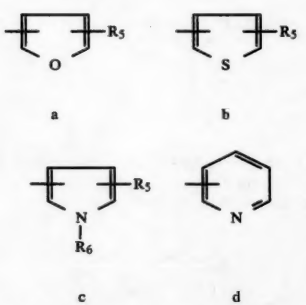


wherein

R_1 represents a hydrogen or halogen atom, a lower alkyl group, a lower alkoxy group or a nitro group, and R_2 represents a hydrogen or halogen atom, a lower alkyl group, a lower alkoxy group or a nitro group, or, if R_1 is a hydrogen atom, R_2 may also be lower alkylthio group or a trifluoromethyl group; or

R_1 and R_2 are bonded to adjacent carbon atoms and together denote a methylenedioxy or ethylenedioxy group;

R_3 represents a group selected from the group consisting of groups corresponding to the formulas a, b, c and d



in which R_5 is a hydrogen, fluorine, chlorine or bromine atom, a lower alkyl group or a nitro group and R_6 is a hydrogen atom, a C_1–C_5-alkyl group, a C_2–C_5-alkyl group which is terminally substituted by a hydroxyl group or a methoxy group, a C_3–C_5-alkenyl group or a cyclopropylmethyl group;

n is zero or, if R_3 is a group a or b, n is 0 or 1, and Y is a halogen atom, a lower alkanesulfonyloxy group, a benzenesulfonyloxy group or a benzenesulfonyloxy group in which the benzene ring is substituted by a lower alkyl group or halogen atom.

4,594,437

PROCESS FOR RECOVERING TOCOPHEROLS FROM DEODORIZER SLUDGE

Sampathkumar, Lincroft, N.J., assignor to UC Unitas Corporation, New York, N.Y.

Filed Feb. 21, 1985, Ser. No. 703,694
Int. Cl.[4] C07D *311/72*
U.S. Cl. 549—413 14 Claims

1. A process for recovering tocopherols from deodorizer sludge containing tocopherols, fatty acids and glycerides of fatty acids which comprises:

forming a mixture of the deodorizer sludge and a solution of urea dissolved in a solvent for urea, the molar ratio of urea to total fatty acids and glycerides of fatty acids being from about 5:1 to about 25:1 and the molar ratio of urea to solvent for urea being from about 1:1 to about 1:75,

heating the mixture to form a urea complex of the fatty acids and glycerides of fatty acids,

cooling the mixture to precipitate the urea complex from the mother liquor containing the tocopherols, and

separating the mother liquor from the precipitate.

4,594,438

PROCESS FOR PREPARING 2,2-DIMETHYL-2,3-DIHYDRO-7-HYDROXYBENZOFURAN

Naoshi Imaki, Atsugi, and Takemi Nakanome, Sagamihara, both of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 475,946, Mar. 16, 1983, Pat. No. 4,499,306. This application Oct. 22, 1984, Ser. No. 663,570
Claims priority, application Japan, Apr. 7, 1982, 57-57546
Int. Cl.[4] C07D *307/86*
U.S. Cl. 549—462 14 Claims

1. A process for preparing 2,2-dimethyl-2,3-dihydro-7-hydroxybenzofuran, which comprises:

heating a 2,2-dihalo-6-halo-6-(1-haloisobutyl)cyclohexanone in the presence of a dehydrohalogenation agent;

hydrolyzing the resulting 2-isobutenyl-6-halophenol in the presence of a copper compound catalyst and an alkali; and

cyclizing the resulting 1,2-dihydroxy-3-isobutenylbenzene in the presence of a cyclization catalyst.

4,594,439

METHOD FOR ASYMMETRIC EPOXIDATION

Tsutomu Katsuki, Sagaken, Japan, and Karl B. Sharpless, Portola Valley, Calif., assignors to The Board of Trustees of the Leland Stanford Jr. University, Stanford, Calif.

Continuation of Ser. No. 287,012, Jul. 27, 1981, Pat. No. 4,471,130, which is a continuation-in-part of Ser. No. 175,786, Aug. 6, 1980, abandoned. This application Aug. 23, 1984, Ser. No. 643,893
Int. Cl.[4] C07C *45/04*
U.S. Cl. 549—523 6 Claims

3. A method for kinetically resolving a chiral carbinol having aliphatic unsaturation separated by from 0 to 2 atoms from said carbinol which comprises:

combining in an inert dry medium said prochiral carbinol with: a metal alkoxide catalyst, wherein said metal is titanium and tantalum and has a coordination number of at least 4, and wherein at least one of said alkoxide groups is optically active at the carbon bonded to oxy; and a hydroperoxide and allowing the reaction to proceed to partial completion where one of the enantiomers of said chiral carbinol reacts more rapidly than the other enantiomer; and isolating enantiomerically enriched starting material.

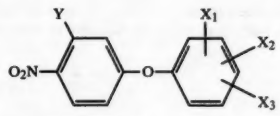
4,594,440

PROCESS FOR RECOVERING AND PURIFYING HERBICIDAL PHENOXYBENZOIC ACID DERIVATIVES

Thomas J. Giacobbe, Skillman, and Grace Tsien, Colonia, both of N.J., assignors to Rhone:Pulenc, Inc., Lyons, France

Continuation of Ser. No. 286,996, Jul. 27, 1981. This application Jul. 25, 1983, Ser. No. 516,968
Int. Cl.[4] C07C *69/76, 79/46*
U.S. Cl. 560—021 10 Claims

1. A process for recovering and purifying a crude phenoxybenzoic acid derivative of the general formula



or salt thereof wherein X_1, X_2 and X_3 each is H, F, Cl, Br, CF_3, OCF_2CHZ_2 (Z=Cl, F or Br), OCF_3, CN, CO_2R (R=lower alkyl), $—C_6H_5$, O-alkyl, NO_2 or SO_2 (lower) alkyl, provided that at least one of X_1, X_2 and X_3 is other than H, and Y=-COOH, or transformation products thereof in which said crude phenoxybenzoic acid derivative or salt is in admixture with one or more isomers thereof and/or one or more other by-products resulting from the process by which said phenoxybenzoic acid is manufactured, which comprises contacting said phenoxybenzoic acid derivative or salt with an inert solvent selected from the group consisting of a hydrocarbon or chlorinated hydrocarbon which selectively dissolves undesired isomer/other by-product and thereafter separating the phenoxybenzoic acid or salt from the solution of undesired isomer-/other by-product.

4,594,441

PROCESS FOR THE PREPARATION OF URETHANES

Kurt Findeisen, Odenthal; Klaus König, Leverkusen; Rudolf Fauss, Cologne, and Peter Heitkämper, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 198,316, Oct. 20, 1980, abandoned. This application May 14, 1984, Ser. No. 610,063
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943549
Int. Cl.[4] C07C *125/06, 125/07*
U.S. Cl. 560—25 8 Claims

1. A process for the preparation of urethanes which are suitable as starting materials for the preparation of organic isocyanates by means of thermal dissociation, said urethanes corresponding to the following general formula:

$$R_1(NHCOOR_3)_n$$

wherein

R_1 represents a radical obtained by removing the isocyanate groups from an n-functional organic isocyanate having a boiling point above 100° C. at atmospheric pressure,

R_3 represents a radical obtained by removing the hydroxyl group from a monohydric alcohol boiling at from 60° to 140° C. at atmospheric pressure with the isocyanate $R_1(NCO)_n$ having a boiling point which is at least 30° C. higher, at atmospheric pressure, than the alcohol R_3—OH, and

n represents an integer of from 1 to 3, **characterized in that** (a) a urethane corresponding to the following general formula:

$$R_1(NHCOOR_2)_n$$

wherein

R_1 and n are as defined above, and

R_2 represents a radical obtained by removing the hydroxyl group from a monohydric alcohol having a boiling point above 140° C. at atmospheric pressure,

is introduced in liquid or molten form into a reaction vessel maintained at from 120° to 250° C.,

(b) gradually adding the alcohol R_3—OH while maintaining the temperature at from 120° to 250° C., and

(c) removing a distillate made up of excess unreacted alcohol R_3OH, separated alcohol R_2OH and depending on the vapor pressure of the product, product urethane $R_1(NHCOOR_3)_n$

which process is continued until the alcohol R_2OH is no longer produced and the product urethane $R_1(NHCOOR_3)_n$ may be recovered in pure form from the distillate or from the residue.

4,594,442

NAPHTHALENYLOXY SUBSTITUTED CARBOXYLIC ACIDS

Ronald A. LeMahieu, North Caldwell, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

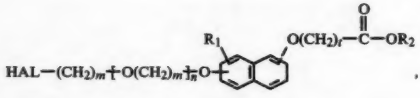
Division of Ser. No. 490,823, May 2, 1983, Pat. No. 4,539,419. This application Apr. 1, 1985, Ser. No. 718,680

Int. Cl.⁴ C07C *69/94*

U.S. Cl. 560—053 **8 Claims**

1. A compound of the formula

IIIa



wherein HAL is halogen, R_1 is hydrogen, acyl or lower alkyl, R_2 is hydrogen or lower alkyl, m is an integer from 2 to 4, n is an integer from 1 to 5, and t is an integer from 1 to 5.

4,594,443

DERIVATIVES OF 4-PHENYL-4-OXO-BUTEN-2-OIC ACID AND THERAPEUTIC USE THEREOF

Mario Bianchi, and Fernando Barzaghi, both of Milan, Italy, assignors to Roussel-Uclaf, Paris, France

Filed Aug. 20, 1984, Ser. No. 642,249

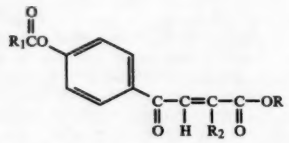
Claims priority, application Italy, Aug. 25, 1983, 22648 A/83

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—053 **24 Claims**

1. Compounds of the formula (I)

(I)



in which R_1 represents alkyl containing from 1 to 18 carbon atoms, R_2 represents hydrogen or alkyl containing from 1 to 8 carbon atoms and R represents hydrogen or alkyl containing from 1 to 8 carbon atoms, as well as the alkali metal, alkaline-earth metal or amine salts thereof, in which R represents hydrogen.

4,594,444

PROCESS FOR THE PREPARATION OF STERICALLY HINDERED HYDROXYPHENYLCARBOXYLIC ACID ESTERS

Ivan Orban, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1984, Ser. No. 680,681

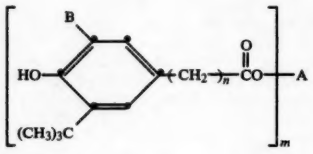
Claims priority, application Switzerland, Dec. 22, 1983, 6857/83

Int. Cl.⁴ C07C *69/88*

U.S. Cl. 560—067 **7 Claims**

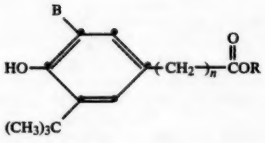
1. A process for the preparation of compounds of the formula I

(I)



in which n is the numbers 0 to 2, m is the numbers 1 to 4, A is a radical which is derived from an m-hydric aliphatic alcohol and has 2 to 18 carbon atoms and B is methyl or t.-butyl, by transesterifying approx. m moles of an ester of the formula II

(II)



in which R is methyl or ethyl, with an alcohol of the formula III

$$A\text{-}(OH)_m \qquad \text{(III)}$$

which comprises (a) carrying out the transesterification in the presence of an oxide or an organometallic compound of a metal of the fourth main group or fourth subgroup of the periodic system, as catalyst, in an amount between 0.05 and 1.0 mol %, based on the ester of the formula II, and (b) distilling the resulting melt in a flash distillation apparatus under a pressure between 0.5 and 6 mbar, and at a temperature between 230° and 270° C., and granulating the resulting melt.

4,594,445

CARBONYLATION PROCESS FOR THE PRODUCTION OF AROMATIC ACIDS AND DERIVATIVES THEREOF

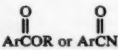
Carl M. Lentz, Mt. Carmel; James R. Overton, and David D. Cornell, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 7, 1985, Ser. No. 689,419

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—103 **13 Claims**

1. A process for the preparation of compounds of the formula



wherein R represents H or an aliphatic moiety having up to about 12 carbon atoms and R′ represents an aliphatic moiety having up to about 12 carbon atoms, said process comprising reacting a diaryliodonium salt of the formula

wherein Ar and Ar' each independently represents a carbocyclic or heterocyclic aromatic moiety having about 5 to about 20 atoms in the ring or rings thereof and X represents a weak acid anion, with (i) carbon monoxide and (ii) a member selected from the group consisting of water, an aliphatic alcohol having up to 12 carbon atoms or a primary amine having up to about 12 carbon atoms in a base reaction medium having a pK_b greater than about 8.0.

4,594,446

2-ALKOXYIMINO-3,3-DIALKOXY-BUTYRATES AND DERIVATIVES

Ikuo Ueda, Toyonaka; Takao Takaya, Kawanishi; Masakazu Kobayashi, Ikeda; Takashi Masugi, Kitamachi; Hisashi Takasugi, Osaka; Hiromu Kochi, Sakai, and Tadashi Kitaguchi, Machi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 411,312, Aug. 25, 1982, Pat. No. 4,518,774, which is a division of Ser. No. 213,217, Dec. 5, 1980, Pat. No. 4,379,922, which is a division of Ser. No. 101,527, Dec. 10, 1979, Pat. No. 4,298,529, which is a continuation-in-part of Ser. No. 73,565, Sep. 7, 1979, abandoned. This application Jan. 14, 1985, Ser. No. 690,989

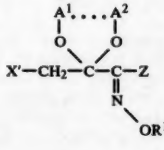
Claims priority, application Japan, Sep. 12, 1978, 53-112555; United Kingdom, Sep. 12, 1978, 36564/78; Japan, Jan. 12, 1979, 54-3106; United Kingdom, Feb. 19, 1979, 7905791

The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.

Int. Cl.[4] C07C *131/00;* **C07D** *321/00, 319/06, 317/14;* **C07F** *7/04*

U.S. Cl. 560—168 **4 Claims**

1. A compound of the formula:



wherein

R^1 is straight or branched alkyl having 1–8 carbons or cycloalkyl having 3–8 carbons,

A^1 and A^2 are each an acetal residue which may be linked together,

X' is hydrogen or halogen, and

Z is a carboxy group esterified with lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy(lower)alkyl, lower alkylthio(lower)alkyl, halo(lower)alkyl, lower alkanoyloxy(lower)alkyl, lower alkanesulfonyl(lower)alkyl, phenyl(lower)alkyl, nitrophenyl(lower)alkyl, phenyl, tolyl, t-butylphenyl, xylyl, mesityl, cumenyl, salicyl, tri(lower)alkylsilyl, di(lower)alkylalkoxysilyl or tri(lower)alkoxysilyl.

4,594,447

PROCESS FOR CATALYTIC DIMERIZATION OF ACRYLIC ACID DERIVATIVES

Günther Wilke; Karin Sperling, and Ludwig Stehling, all of Mulheim am Rhein, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim am Rhein, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,292

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, 3336691

Int. Cl.[4] C07C *67/343*

U.S. Cl. 560—202 **7 Claims**

1. A process for the catalytic dimerization of derivatives of acrylic acid in the homogeneous phase, characterized in that a compound having the formula $H_2C{=}CR^1{-}COOR^2$, wherein R^1 represents H or a linear alkyl group having from 1 to 3 carbon atoms and R^2 represents a linear alkyl group having from 1 to 3 carbon atoms, is reacted in a solvent at a temperature of from −50° C. to +50° C. in the presence of nickel compounds as catalysts which contain complex anions X in a molar ratio Ni:X=1:1 and organic or hydride ligands and are modified with phosphanes having the formula PR_2R', wherein R and R' may be same or different and represent alkyl residues having from 1 to 8 carbon atoms or phenyl residues.

4,594,448

ESTERS OF VINYLCARBOXYLIC ACIDS

Heinz-Jürgen Hohage, Muehltal, Fed. Rep. of Germany, assignor to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

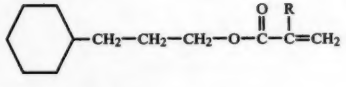
Filed Aug. 9, 1985, Ser. No. 764,010

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430446

Int. Cl.[4] C07C *69/52;* **C08F** *32/00*

U.S. Cl. 560—220 **4 Claims**

1. Esters of vinylcarboxylic acids having the formula (I):



wherein R is H, or methyl.

4,594,449

PROCESS FOR PRODUCING TEREPHTHALIC ACID SUITABLE FOR USE IN DIRECT POLYMERIZATION

Toshiaki Takuma; Takayuki Tsumura; Takanori Tsugiya; Katsuya Murakami, and Yasue Nakajima, all of Yokkaichi, Japan, assignors to Kuraray Yuka Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 556,161

Claims priority, application Japan, Dec. 3, 1982, 57-212881

Int. Cl.[4] C07C *51/265*

U.S. Cl. 562—416 **11 Claims**

1. In a process for producing terephthalic acid suitable for use in direct polymerization, which comprises oxidizing p-xylene with molecular oxygen in an acetic acid solvent in the presence of a heavy metal compound and a bromine compound, the improvement wherein after a main reaction step of oxidizing at least 90 mole % of p-xylene fed has been performed,

(1) a first purifying step of feeding a gas containing molecular oxygen to the oxidation reaction mixture in slurry form obtained from the main reaction step and containing p-toluic acid, 4-carboxybenzaldehyde and p-acetoxymethylbenzoic acid in a total concentration of from 2,000 ppm to 40,000 ppm in the mother liquor, said gas being in such a proportion that the concentration of oxygen in the off-gas becomes at least 0.5% by volume while smashing the oxidation reaction mixture at a temperature of 140° to 230° C. to decrease the

average particle diameter of terephthalic acid by at least 20% from its average particle diameter before smashing, and (2) a second purifying step of feeding a gas containing molecular oxygen to the slurry from the first purifying step containing 4-carboxybenzaldehyde in a concentration of from 10 to 1,000 ppm in the mother liquor, said gas being in such a proportion that the concentration of oxygen in the off-gas becomes 0.05 to 5% by volume, and contacting the slurry with the molecular oxygen-containing gas at a temperature at least 10° C. higher than in the first purifying step and within the range of 180° to 300° C.,

are performed successively, and the resulting purified slurry is subjected to solid-liquid separation to recover terephthalic acid.

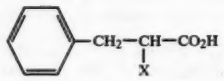
4,594,450

PROCESS FOR PRODUCING AN α-HALOGENO-β-PHENYLPROPIONIC ACID

Kiyotaka Oyama, Hikari, and Tuneo Harada, Shin-nanyo, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

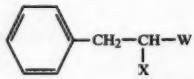
Filed Oct. 12, 1984, Ser. No. 660,369
Int. Cl.⁴ C07C *57/30*
U.S. Cl. 562—496 **7 Claims**

1. In a process for producing an α-halogeno-β-phenyl-propionic acid represented by the formula (I):



(I)

where X is a halogen atom, which comprises hydrolyzing under heating a halogen-containing ethylbenzene derivative represented by the formula (II):



(II)

where W is a cyano group, an amidocarbonyl group or a lower alkoxycarbonyl group, and X is as defined above, and an aqueous mineral acid solution under vigorous stirring, the improvement which comprises conducting said reaction in a two-phase system in the absence of an organic acid.

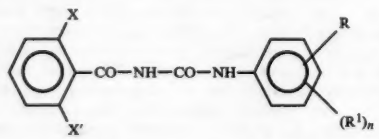
4,594,451

BENZOYL-UREAS EXERTING AN INSECTICIDE ACTIVITY

Pietro Massardo, Milan; Franco Bettarini; Gabriele Giovarruscio, both of Novara; Paolo Piccardi; Franca Reggiori, both of Milan; Vincenzo Caprioli, San Martino, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Apr. 19, 1984, Ser. No. 601,968
Claims priority, application Italy, Apr. 22, 1983, 20744 A/83
Int. Cl.⁴ C07C *127/22*
U.S. Cl. 564—44 **7 Claims**

1. A compound formula:

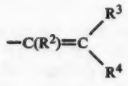


(I)

in which

one of X and X′ is hydrogen, fluorine or chlorine and the other fluorine or chlorine;

R represents a group



in which R^2 represents hydrogen, chlorine, fluorine, bromine or an alkyl C_1–C_3 optionally substituted by 1 to 3 halogen atoms;

R^3 represents a halogen atom or an alkyl C_1–C_3 optionally substituted by from 1 to 3 halogen atoms;

R^4 is the same as R^3 or represents a hydrogen atom;

R^1 represents a hydrogen atom, a halogen, an alkyl C_1–C_3 optionally substituted by from 1 to 3 halogen atoms, a group OCH_3, SCH_3 or OCF_3;

n is an integer from 1 to 4.

4,594,452

PROCESS FOR THE PREPARATION OF ANHYDROUS N-(3-CHLORO-2-HYDROXYPROPYL) TRIALKYLAMMONIUM SALTS

Herbert K. Reimschuessel, Morristown, and Michael A. Kocur, Union, both of N.J., assignors to Allied Corporation, Morris Township, N.J.

Filed Jun. 24, 1985, Ser. No. 748,083
Int. Cl.⁴ C07C *91/26*
U.S. Cl. 564—292 **6 Claims**

1. A process for the production of pure, anhydrous, crystalline N-(3-chloro-2-hydroxypropyl)trialkylammonium salt of the general formula:

$$ClCH_2CHOHCH_2N^+R^1R^2R^3X^-$$

where R^1, R^2 and R^3 are alkyl groups the number of carbon atoms of each one is either the same or different at each occurrence, and is in the range of 1 to 12, and X^- is an anion selected from halide, nitrate, sulfate, and perchlorate;

which comprises reacting a trialkylamine salt of the formula:

$$HN^+R^1R^2R^3X^-$$

wherein R^1, R^2 and R^3 are alkyl or hydroxy alkyl groups the number of carbon atoms of each one is either the same or different at each occurrence, and is in the range of 1 to 12 and X^- is an anion selected from halide, nitrate, sulfate, and perchlorate

which has been dissolved in a suitable organic solvent, with epichlorohydrin at a temperature in the range of from about 0° C. to about 50° C. and separating the solid reaction product from the reaction medium; said organic solvent being selected from the group of organic solvents that dissolve epichlorohydrin and the particular trialkylamine salt, and are non-solvents for the resultant N-(3-chloro-2-hydroxypropyl)trialkylammonium salt.

4,594,453

PROCESS FOR PREPARING (HYDROCARBYLTHIO)AROMATIC AMINES

Paul F. Ranken, Baton Rouge, La., and Bonnie G. McKinnie, Magnolia, Ark., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 11, 1984, Ser. No. 619,675
Int. Cl.⁴ C07C *149/42*
U.S. Cl. 564—440 **11 Claims**

1. A process which comprises reacting a hydrocarbyl disulfide with an aromatic amine having no substituents other than hydrogen on any positions to be substituted by hydrocar-

bylthio groups in the presence of a catalytic amount of a Lewis acid so as to form a (hydrocarbylthio)aromatic amine.

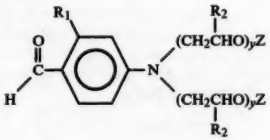
4,594,454

P-FORMYL-N,N-DIPOLYOXYALKYLENESUBSTITUTEDANILINE

Patrick D. Moore, Spartanburg, and Robert L. Mahaffey, Jr., Inman, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 27, 1984, Ser. No. 644,375
Int. Cl.[4] C07C *87/52*
U.S. Cl. 564—305 **1 Claim**

1. A Compound of the formula:



wherein R_1 is selected from an alkyl group having from one to about two carbon atoms, a halide group selected from chlorine, bromine or iodine, or an alkoxy group having from one to about two carbon atoms; R_2 is selected from H or an alkyl group having from one to about two carbon atoms; y is a number of from 2 to about 200; and Z is H.

4,594,455

AMINE COMPOSITIONS PRODUCED BY CATALYTIC ALKYLATION OF METHYLAMINE BY LONG CHAIN ALCOHOLS

Zdzislaw W. Dudzinski, Clifton, N.J., assignor to Millmaster Onyx Group, Inc., New York, N.Y.

Filed Mar. 23, 1984, Ser. No. 593,025
Int. Cl.[4] C07C *87/06, 85/06*
U.S. Cl. 564—463 **12 Claims**

1. A method of producing mixtures of amines by catalytic alkylation of methylamine which comprises reacting methylamine with a primary, acyclic, monohydric fatty alcohol, having 8 to 20 carbon atoms in the presence of a catalyst comprising a mixture of (a) unsupported copper oxide, (b) an unsupported Group IIA metal oxide or hydroxide and (c) either nickel, nickel oxide or a mixture of nickel and nickel oxide on kieselguhr.

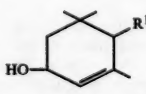
4,594,456

RACEMIC AND OPTICALLY ACTIVE 3-HYDROXY-ALPHA-CYCLOCITRAL, ITS ACETALS AND OPTICALLY ACTIVE 3-OXO-ALPHA-CYCLOCITRAL ACETALS, AND THEIR PREPARATION

Ulrich Schaefer-Luederssen; Hagen Jaedicke, both of Ludwigshafen; Joachim Paust, Neuhofen, and Manfred Eggersdorfer, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

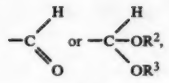
Filed Jan. 20, 1984, Ser. No. 572,239
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301718; Nov. 17, 1983, 3341463
Int. Cl.[4] C07C *47/267*
U.S. Cl. 568—447 **17 Claims**

1. A 3-hydroxy-α-cyclocitral of the formula I



(I)

wherein R^1 is



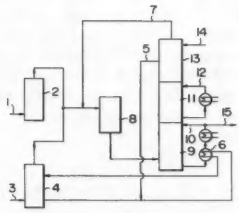
R^2 and R^3 can be identical or different and are each a straight-chain or branched alkyl group of 1 to 6 carbon atoms, or R^2 and R^3 together form an ethylene or propylene group which can be substituted by methyl or ethyl.

4,594,457

PROCESS FOR PRODUCING AQUEOUS FORMALDEHYDE SOLUTION

Kyugo Yoshikawa, Shirone, and Tadahiro Matsuzawa, Yokohama, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 10, 1985, Ser. No. 721,814
Claims priority, application Japan, Apr. 12, 1984, 59-73759
Int. Cl.[4] C07C *47/052*
U.S. Cl. 568—473 **8 Claims**



1. A process for producing an aqueous formaldehyde solution having a formaldehyde concentration of 37 to 60% by weight which comprises subjecting a feed gas containing methanol and, per mole of said methanol, 1.5 to 2.0 moles of air and 0.2 to 0.8 moles of an aqueous solution containing 0.1 to 3.0% by weight of methanol and 0.1 to 1.0% by weight of formaldehyde, said aqueous solution being obtained as a side cut from an absorption column used in the process, to catalytic reaction over a silver catalyst at a temperature of 580° C. to 680° C. to form a product gas; contacting the product gas with absorbing water in said absorption column to absorb the formaldehyde into the absorbing water from the product gas; recovering the desired aqueous formaldehyde solution as bottoms of the absorption column; withdrawing said aqueous solution containing 0.1 to 3.0% by weight of methanol and 0.1 to 1.0% by weight of formaldehyde at an upper level of said absorption column as a side cut in an amount corresponding to the amount used in the feed gas; combining said aqueous solution with methanol and air to form said feed gas; and adding an amount of water to the top of said absorption column corresponding to the total of the amount of said aqueous solution withdrawn as the side cut and an amount of water necessary for adjusting the concentration of the product aqueous formaldehyde solution.

4,594,458

VINYL ETHER MONOMERS DERIVED FROM ALKYL PERFLUORO-ω-(2-IODOETHOXY) COMPOUNDS

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 472,101, Mar. 4, 1983, Pat. No. 4,531,011. This application May 3, 1985, Ser. No. 730,067
Int. Cl.[4] C07C *43/16, 43/17*
U.S. Cl. 568—615 **5 Claims**

1. A vinyl ether monomer of the formula

$CF_2{=}CFR_fOCF_2CF_2I$

wherein

R_F is $-OCF_2CF(CF_3)[OCF(CF_3)CF_2]_m$ or $[OCF(CF_3)CF_2]_n$;

m is an integer from 1 to 7; and

n is an integer from 1 to 4.

4,594,459

PREPARATION OF P-ISOPROPENYL PHENOL AND RELATED COMPOUNDS

Kimio Inoue, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1985, Ser. No. 715,550

Int. Cl.[4] C07C *37/52, 39/06*

U.S. Cl. 568—781 **20 Claims**

1. A process for the cleavage of cleavable organic compounds, comprising contacting a cleavable organic compound represented by the formula

$$(X)_n{-}Ar{-}Z{-}Ar{-}(X')_m$$

wherein each Ar independently is an aromatic moiety, Z is an optionally substituted aliphatic moiety having from 2 to about 7 carbon atoms, X and X' are independently electron-withdrawing or electron-donating moieties, and n and m are integers, with the proviso that the quantity (m+n) is greater than zero; with an alkaline catalyst and at least one gas under supercritical conditions such that the corresponding monomeric alkenyl aromatic compound is produced.

4,594,460

PROCESS FOR SELECTIVE C-ALKYLATION OF PHENOLS

Gerard Mignani, Lyons, and Didier Morel, Villiers sur Orge, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

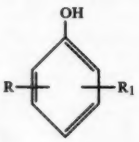
Filed Mar. 19, 1985, Ser. No. 713,691

Claims priority, application France, Mar. 22, 1984, 84 04443

Int. Cl.[4] C07C *37/14, 39/06*

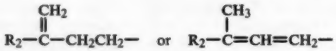
U.S. Cl. 568—794 **9 Claims**

1. A process for the preparation of a phenol of the formula:

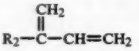


(I)

in which R_1 is in ortho or para position to the hydroxyl group and is a radical of formula

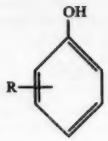


in which R_2 is an acyclic radical of 1 to 6 carbon atoms and R is hydrogen or 1 to 3 substituents, which may be the same or different, chosen from halogen, hydroxy which may be in the form of an ether, alkyl, amino, and alkoxycarbonyl, it being understood that two of the symbols R may form with the phenyl ring a condensed aromatic ring, which comprises reacting a butadiene of formula:



(II)

in which R_2 is defined as before, with a phenol of formula:



(III)

in which R is defined as before, and at least one position ortho or para to the hydroxy radical is unsubstituted, in sufficient water at a temperature from 50° C. to 200° C. to dissolve all the catalyst and at least a part of the phenol and substituted butadiene employed, in the presence of a rhodium-based catalyst in an amount from 10^{-4} to 1 gram-atoms of rhodium per liter of reaction solution, a water-soluble phosphine in an amount such that the number of gram-atoms of trivalent phosphorus relative to one gram-atom of rhodium is from 0.1 to 200, and an inorganic or organic base in an amount from 0.005 to 5 moles of base per liter of aqueous solution.

4,594,461

PREPARATION OF TRIMETHYLOLALKANES FROM ALKANALS AND FORMALDEHYDE

Franz Merger, Frankenthal; Peter Hettinger, Edingen-Neckarhausen; Leopold Hupfer, Friedelsheim, and Juergen Paetsch, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 5, 1984, Ser. No. 668,026

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340791

Int. Cl.[4] C07C *29/14, 29/80, 29/38, 31/22*

U.S. Cl. 568—853 **11 Claims**

1. A process for the preparation of a trimethylolalkane which comprises:

reacting an n-alkanal with formaldehyde and a trialkylamine in aqueous solution at a temperature of from 40° C. up to about 120° C., using from 2.2 to 4.5 moles of formaldehyde and from 0.6 to 3 moles of trialkylamine per mole of the alkanal,

hydrogenating the resulting reaction mixture, and

recovering the trimethylolalkane by distillation.

4,594,462

PREPARATION OF BUTANE-1,4-DIOL

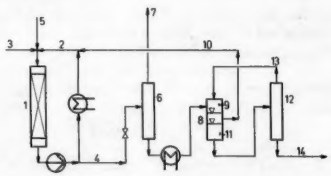
Rolf Schnabel, Schifferstadt, and Hans-Martin Weitz, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 26, 1985, Ser. No. 748,998

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423447

Int. Cl.[4] C07C *29/136, 31/20*

U.S. Cl. 568—864 **6 Claims**



1. A process for the preparation of butane-1,4-diol by catalytic hydrogenation of dibutyl succinate at from 150° to 300° C. and under a pressure of above 100 bar, wherein hydrogenation is terminated before complete conversion is reached, butanol is distilled off from the reaction mixture, the liquid distillation residue is cooled to below 108° C., the upper phase, which is

formed as a result of phase separation and essentially consists of dibutyl succinate, is recycled to the hydrogenation, and the butane-1,4-diol is obtained from the lower phase, which essentially consists of this compound, by fractional distillation under reduced pressure.

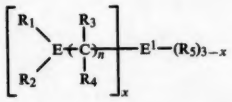
4,594,463

SYNTHESIS OF ALDEHYDES FROM ALCOHOLS

Richard W. Wegman, South Charleston, and Deborah S. Miller, Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 28, 1985, Ser. No. 695,370
Int. Cl.[4] C07C *45/49*
U.S. Cl. 568—487 **18 Claims**

1. Method of synthesizing aldehydes which comprises contacting a primary alcohol having the formula, ROH, wherein R is an alkyl group having 1 to about 20 carbon atoms, a cycloalkyl group having 4 to about 7 carbon atoms, or an aralkyl group having about 6 to about 18 carbon atoms, with a mixture of carbon monoxide and hydrogen at a temperature of about 100° C. to about 300° C. under superatmospheric pressure in the presence of a catalyst consisting essentially of a soluble rhodium containing compound, an iodide containing compound and a chelating compound having the generic formula:



wherein each of R_1, R_2, R_3, R_4 and R_5 is an organic moiety or hydrogen and can be alike or different, E and E^1 are each Group V elements, n is an integer having values of 1 to about 4, and x is an integer having values of 1 to 3 inclusive, for a period of time sufficient to produce a primary aldehyde having the formula, RCHO.

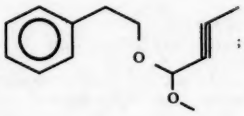
4,594,464

METHYL PHENETHYL ACETAL OF 2-BUTYNAL

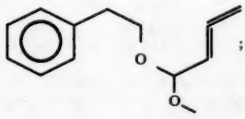
Richard M. Boden, Ocean, and Joseph A. McGhie, South Orange, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 609,345, May 11, 1984. This application Jun. 7, 1985, Ser. No. 742,273
Int. Cl.[4] C07C *43/164*
U.S. Cl. 568—592 **5 Claims**

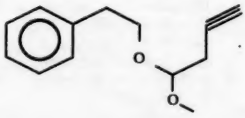
1. An acetal selected from the group consisting of compounds having the structures:



;



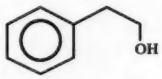
; and



.

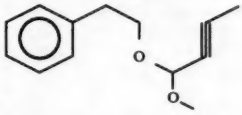
3. The product produced according to the process comprising the step of intimately admixing the compound having the structure:

with beta-phenethyl alcohol having the structure:



wherein the mole ratio of compound having the structure:

to beta-phenethyl alcohol is about 1:1 at a temperature in the range of from about 100° up to about 150° C. at about 1 atmosphere pressure whereby a composition of matter containing a substantial amount of compound having the structure:



is formed, the reaction being carried out in the presence of an alkali metal hydride.

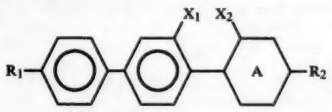
4,594,465

COMPOUNDS CONTAINING A FLUOROBIPHENYLYL GROUP

Lawrence Kam Ming Chan, Hull; George W. Gray, Cottingham; Kenneth J. Toyne; David Lacey, both of Hull, all of England; Rudolf Eidensschink, Münster, and Michael Römer, Rodgau, both of Fed. Rep. of Germany, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England and Merck Patent Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,322
Claims priority, application United Kingdom, Jul. 22, 1983, 8319849
Int. Cl.[4] C07C *43/20, 25/18, 69/017*
U.S. Cl. 568—642 **5 Claims**

1. A terphenyl having a formula:



wherein:

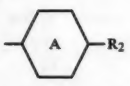
R_1 is selected from H, alkyl, alkoxy, alkylcarbonyl, alkylcarbonyloxy and alkoxycarbonyloxy;

R_2 is selected from H, alkyl, alkoxy;

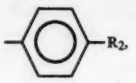
X_1 is selected from H and fluorine;

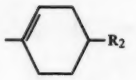
X_2 is selected from H and fluorine;

and

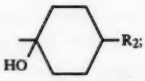


is selected from





and



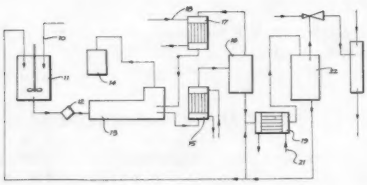
provided that one of X_1 and X_2 is fluorine.

4,594,466

RECOVERY OF ALCOHOLS

Russell R. Reeves, Richmond, Australia, assignor to Apace Research Limited, Richmond, Australia

Filed Aug. 1, 1985, Ser. No. 761,482
Claims priority, application Australia, Aug. 22, 1984, PG6711
Int. Cl.[4] C07C *29/74, 31/08*
U.S. Cl. 568—919 9 Claims



1. A process for the recovery of a low molecular weight alcohol from an aqueous fermentation medium containing no more than 40% by volume of the alcohol, said process comprising:

dissolving in the fermentation medium at least 26 grams/100 ml of fermentation medium of a base or basic salt the conjugate acid of which has a pKa of above 6 and which salt has a solubility of at least 26 grams/100 ml of fermentation medium and is substantially more soluble in water than in the alcohol, to form (a) an alcohol rich phase; (b) an alcohol poor salt rich phase; and (c) a solid phase of flocculated particles originally dissolved in the fermentation medium;

recovering the alcohol rich phase and the solid phase separately; and

recovering the salt from the salt rich phase in a form suitable for reuse in the present process.

4,594,467

PREPARATION OF 3,5-DICHLORO-α-METHYLSTYRENE

Karl-Wilhelm Henneke; Herbert Diehl, both of Leverkusen, and Karlfried Wedemeyer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 6, 1985, Ser. No. 763,094
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430020
Int. Cl.[4] C07C *17/00*
U.S. Cl. 570—193 7 Claims

1. In the preparation of 3,5-dichloro-α-methylstyrene by dehydrobromination of α-bromo-3,5-dichlorocumene, the improvement which comprises reacting the α-bromo-3,5-dichlorocumene with an alkali metal hydroxide solution in the presence of a phase-transfer catalyst above 70° C.

4,594,468

PROCESS FOR THE PREPARATION OF MIDDLE DISTILLATES FROM SYNGAS

Johannes K. Minderhoud, and Swan T. Sie, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 646,193, Aug. 31, 1984, abandoned.
This application Sep. 27, 1985, Ser. No. 780,722
Claims priority, application Netherlands, Sep. 12, 1983, 8303142
Int. Cl.[4] C10G *51/02*
U.S. Cl. 585—310 21 Claims

1. A process for the preparation of middle distillates from a mixture of carbon monoxide and hydrogen, characterized in that a H_2 and CO containing feed is contacted in the first step at elevated temperature and pressure with a catalyst comprising 3–60 pbw cobalt and 0.1–100 pbw of at least one other metal chosen from the group formed by zirconium, titanium and chromium per 100 pbw silica, alumina or silica-alumina, which catalyst has been prepared by kneading and/or impregnation and satisfies the relation

$$(3 + 4\,R) > \frac{L}{S} > (0.3 + 0.4\,R),$$

wherein

L=the total quantity of cobalt present on the catalyst, expressed as mg Co/ml catalyst,

S=the surface area of the catalyst, expressed as m^2/ml catalyst, and

R=the weight ratio of the quantity of cobalt deposited on the catalyst by kneading to the total quantity of cobalt present on the catalyst, and that in a second step the total reaction product of the first step, without components being removed therefrom or component being added thereto, is subjected to a hydrocracking treatment by contacting it at an elevated temperature and a pressure which corresponds substantially with that used in the first step, with a catalyst comprising one or more noble metals of Group VIII supported on a carrier, the H_2/CO molar ratio of the feed and the reaction conditions of the first step being so chosen that the reaction product of the first step contains sufficient unconverted hydrogen for carrying out the hydrocracking reaction in the second step.

4,594,469

METHOD FOR THE OLIGOMERIZATION OF ALPHA-OLEFINS

Frederick C. Loveless, Cheshire; Aspet V. Merijanian, Middlebury; David J. Smudin, Waterbury, and Walter Nudenberg, Newtown, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Sep. 8, 1983, Ser. No. 530,336
Int. Cl.[4] C07C *3/21*
U.S. Cl. 585—511 5 Claims

1. A process for oligomerizing alpha-olefins comprising contacting in a reaction zone under reaction conditions:

(1) Alpha olefins having at least three carbon atoms; and

(2) A catalyst composition consisting essentially of (a) an alkyl aluminum bromide or iodide compound having the formula $R_3Al_2X_3$ or R_nAlX_{3-n}, wherein n is 1; R is an hydrocarbyl group and X is a reactive halogen selected from bromine and iodine; and (b) a cocatalyst which is selected from the group consisting of alkyl iodide and alkyl bromide.

4,594,470

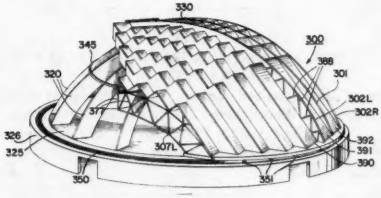
SOLAR GENERATOR MOUNTING STRUCTURE

Richard T. Headrick, 5200 Irvine Blvd., Space #24, Irvine, Calif. 92715

Continuation-in-part of Ser. No. 527,164, Aug. 26, 1983, abandoned. This application May 22, 1984, Ser. No. 612,797

Int. Cl.[4] H01L *31/04*

U.S. Cl. 136—246 **39 Claims**



1. A solar generator structure comprising:

a domeshaped support segment having a plurality of stepped, flat, upwardly facing surfaces mounting solar cell panels thereon; and

means for rotating said support segment about a vertical axis at the dome's apex so that said solar panels follow the sun's movements.

4,594,471

PHOTOELECTRIC CONVERSION DEVICE

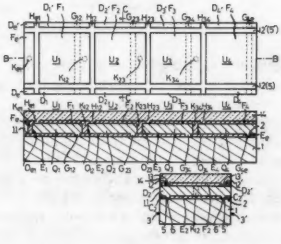
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Jul. 12, 1984, Ser. No. 630,063

Claims priority, application Japan, Jul. 13, 1983, 58-128270; Oct. 31, 1983, 58-204441; Mar. 26, 1984, 59-57713

Int. Cl.[4] H01L *27/14*

U.S. Cl. 136—249 **6 Claims**



1. A photoelectric conversion device which is provided with a plurality of series-connected semiconductor transducers U_1, U_2, . . . , comprising:

(a) a substrate having an insulating surface;

(b) a plurality of spaced apart first electrodes E_1, E_2, . . . , formed side by side on the substrate;

(c) a non-single-crystal semiconductor laminate member formed on the substrate to cover the first electrodes E_1, E_2, . . . ; and

(d) a plurality of second electrodes F_1, F_2, . . . formed on the non-single-crystal semiconductor laminate member in opposing relation to the first electrodes E_1, E_2, . . . , respectively;

wherein:

the semiconductor transducer U_i (where i+1, 2, . . .) is constituted by first electrode E_i, a second electrode F_i, and a region Q_i of the non-single-crystal semiconductor laminate member which is sandwiched between the first and second electrodes E_i and F_i,

the second electrode F_i is connected to the first electrode E_{i+1} of an adjacent semiconductor transducer U_{i+1} through a contact portion $K_{i(i+1)}$;

each of the plurality of first electrodes E_1, E_2, . . . is respectively isolated from adjacent ones by a plurality of first isolation grooves G_{12}, G_{23}, . . . sequentially arranged along the direction of arrangement of the first electrodes;

the non-single-crystal laminate member extends into the plurality of first isolation grooves G_{12}, G_{23}, . . .

each of the plurality of second electrodes F_1, F_2, . . . is respectively isolated from adjacent ones by a plurality of second isolation grooves H_{12}, H_{23}, . . . sequentially arranged along the direction of arrangement of the second electrodes;

the second isolation groove $H_{i(i+1)}$ extends in opposing relation to a region of the first electrode E_{i+1} on the side of the isolation groove $G_{i(i+1)}$, and thereby, the second electrode F_i is opposite a region of the first electrode E_{i+1} on the side of the isolation groove $G_{i.(i+1)}$;

in the region of the non-single-crystal semiconductor laminate member across from which the second electrode F_i is opposite the first electrode E_{i+1}, there is cut a contact groove $O_{i(i+1)}$ which extends between the second electrode F_1 and the first electrode E_{i+1};

the second electrode F_i extends, as the contact portion $K_{i(i+1)}$, through the contact groove $O_{i(i+1)}$ to reach the first electrode E_{i+1};

the side walls of at least the first electrode E_i of the semiconductor transducer U_i, which extends along the longitudinal direction of arrangement of the semiconductor transducers U_i, U_2, . . . lie at a distance inside the walls of the substrate; and

the side walls of the semiconductor transducer U_i, in said longitudinal direction, are substantially co-extensive with said side walls of the substrate.

4,594,472

CONDUCTIVE GASKETS

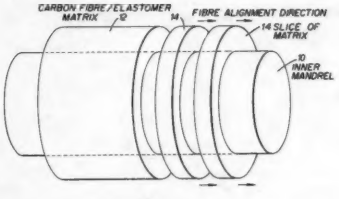
Jack Brettle, Greens Norton; Kevin J. Lodge, Brackley; Nicholas J. Loggie, West Wycombe; Simon M. P. Hughes, Abbey Chase, and William G. Howell, Greens Norton, all of United Kingdom, assignors to Plessey Overseas Limited, Ilford, England

Filed Oct. 28, 1983, Ser. No. 546,579

Claims priority, application United Kingdom, Oct. 29, 1982, 8231038; Apr. 26, 1983, 8311332

Int. Cl.[4] H05K *9/00*

U.S. Cl. 174—35 GC **13 Claims**



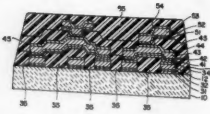
1. A conductive gasket for prevention of EMI interferences to electrical equipment within an enclosure, the gasket having spaced sides for contacting opposed surfaces between which a conductor path is to be provided, the gasket comprising an elastic material in which conductive paths extend from one spaced side of the gasket to the other, said conductive paths each being formed by a plurality of high aspect ratio conductive fibres aligned substantially at right angles to the sides of the gasket.

4,594,473

SUBSTRATE HAVING AT LEAST ONE FINE-WIRED CONDUCTIVE LAYER

Tatsuo Inoue, and Mitsuru Kimura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,917
Claims priority, application Japan, Mar. 11, 1983, 58-40060
Int. Cl.[4] H05K 1/09
U.S. Cl. 174—68.5 6 Claims



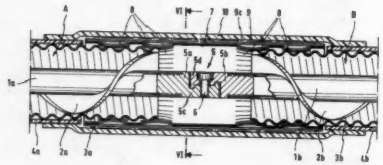
1. A substrate comprising a first fine wiring conductive layer consisting of a first metal film formed over the surface of an insulated substrate, a gold conductive layer formed over said first metal film, a first palladium film formed over said gold conductive layer; and a polyimide resin layer covering said first fine wiring conductive layer.

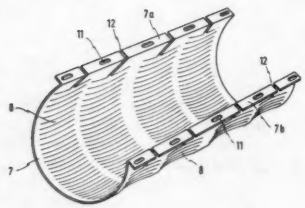
4,594,474

CONNECTING DEVICE FOR COAXIAL CABLES

Georg Spinner, Am Eichberg 12, 8152 Feldkirchen-Westerham, Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 697,736
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403805
Int. Cl.[4] H02G 15/08
U.S. Cl. 174—88 C 12 Claims





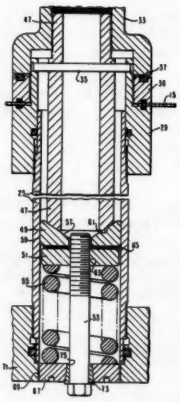
12. A connection of conductors of cables, comprising: a sleeve bridging the cables and having one portion resiliently surrounding and contacting the conductor of the one cable and another portion resiliently surrounding and contacting the conductor of the other cable, each of said portions including at least one annular section which is arched radially inwardly and is provided with a plurality of slots extending parallel to each other to define radially resilient webs between said slots; and clamping means for tightening said sleeve in circumferential direction.

4,594,475

ELECTRICAL BUSHING HAVING A CONVERTIBLE CENTRAL CONDUCTOR

Dennis C. Bowman, and James L. Marlowe, both of Bells, Tenn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 3, 1984, Ser. No. 637,373
Int. Cl.[4] H01B 17/26
U.S. Cl. 174—152 R 5 Claims



1. An electrical insulating bushing comprising:
a tubular column including an insulating portion;
a tubular first conductor within said column;
a second conductor within the first conductor;
a first terminal at one end of the column connecting with corresponding ends of the first and second conductors;
a second terminal at the other end of the column and including means for electrically connecting the first and second conductors and comprising an annulus having a first surface contacting the first conductor and a second surface contacting the second conductor, and the second surface being inclined at an angle to the axes of the first and second conductors; and
pressure means for biasing the annulus against the second conductor so as to effect spaced alignment between the conductors.

4,594,476

BROADCAST INTERACTIVE TELEPHONE SYSTEM

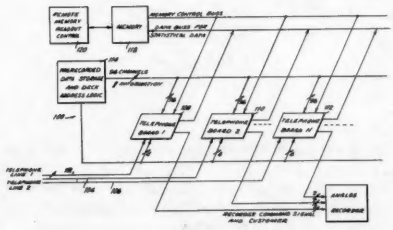
Michael J. Freeman, 31 Cornwall La., Sands Point, N.Y. 11050

Filed Aug. 31, 1984, Ser. No. 646,295
Int. Cl.[4] H04M 1/64
U.S. Cl. 179—6.08 31 Claims

1. In a verbally interactive telephone interrogation system comprising a two-way telephone subscriber network including a plurality of telephone caller means and a telephone message routing means operatively connected to said plurality of telephone caller means for selectively connecting individual ones of said plurality of telephone caller means to a remote message transmission means having an associated telephone number in response to provision of a unique dialing code from any of said

telephone caller means corresponding to said associated telephone number, each of said telephone caller means comprising telephone reception means for receiving audio messages over said two-way telephone subscriber network and signal generator means for selectively providing the unique signal outputs to be transmitted over said two-way telephone subscriber network, said two-way subscriber network comprising a plurality of incoming telephone lines to said remote transmission message means; the improvement comprising

storage means capable of retrievably storing a plurality of parallel retrievable channel sets of interactive audio information, having substantially the same audio information and content duration, said parallel channel sets of retrievable audio information being simultaneously broadcast with each parallel channel set audio information content having a message initiation time and message termination time, each of said channel message set initiation times and termination times being staggered in real time with respect to each other; each of said channel sets comprising a plurality of interactively related channels of audio information responsive to individual interactive selection by a caller connected thereto via said subscriber network;



means responsive to an activation signal for initiating cyclical simultaneous rebroadcast of said staggered parallel channel sets audio information, independent of subsequent caller selection of said information; and

means for providing independent interactive parallel processing of multiple subscriber calls to said associated telephone number whereby each caller contacting said associated telephone number may independently interact with said audio information in a given channel set for providing an individualized interactive message over said two-way subscriber network via said subscriber signal generator to said storage means and receive an individualized interactive audio response in response thereto directly dependent on said caller individual selection for providing an individualized interactive communication;

said storage means comprising a message selection maze comprising multiple levels and multiple channels within said level with each level having staggered message initiation times, whereby a plurality of subscribers may engage in substantially simultaneous interactive telephone communication.

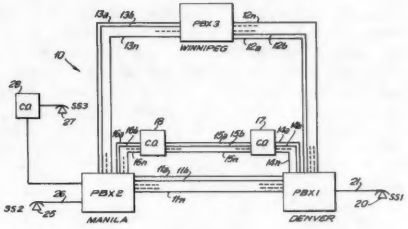
4,594,477

PBX EQUIPMENT WITH DIAL SIGNAL MODIFICATION

Tamarra J. Noirot, Boulder, Colo., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Mar. 7, 1984, Ser. No. 586,926
Int. Cl.[4] H04M *3/42, 7/14, 15/34*
U.S. Cl. 179—18 AD **7 Claims**

5. A method of processing any of a plurality of strings of dial signals respectively representing digits dialed as part of telephone calls which are incoming to a first program-controlled private branch exchange telephone equipment ("PBX") and are destined for remote stations reachable from such first PBX over a plurality of telephone routes including (a) routes provided at least in part by a private telephone network interconnecting said first PBX with one or more additional PBX's and (b) routes provided at least in part by direct distance dialing lines and one or more common carrier telephone networks, said first PBX being operable to select for any of said calls a one of said plurality of routes for transmission of such call to the remote station for which that call is destined, and said method comprising: holding temporarily in said first PBX the string of dial signals received thereby as part of any particular such call incoming to said first PBX, storing in memory means in said first PBX data for each of said plurality of routes the dial signals necessary to complete a call over that route, utiliz-



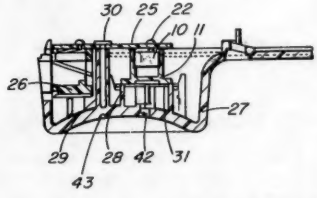
ing an indication of the one of such plurality of routes selected by said first PBX for transmission of said particular call to address said memory means so as to read-out therefrom control signals indicative of which dial signals are necessary for completion of such particular call over such route selected therefor, modifying, when appropriate, individual of said held dial signals so as to produce for said particular call a modified string of held dial signals assuring completion of that call over said route selected therefor, and then outpulsing the string of held dial signals from said first PBX and over such selected route.

4,594,478

TRANSMITTER ASSEMBLY FOR A TELEPHONE HANDSET

Beverley W. Gumb; Raymond C. Freeman, both of London, and Alan C. Busche, Dorchester, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 26, 1984, Ser. No. 634,690
Claims priority, application Canada, Mar. 16, 1984, 449775
Int. Cl.[4] H04B *1/03*
U.S. Cl. 179—103 **5 Claims**



1. A transmitter assembly for a telephone handset, comprising:

a tubular transmitter housing having a front face, a back end, and a peripherally extending wall between said front face and said back end;

a tubular formation on an inner surface of said front face, integral with said front face, said tubular formation having an end surface spaced from said front face;

a transmitter assembly in said tubular transmitter housing, said transmitter assembly comprising a cartridge electret

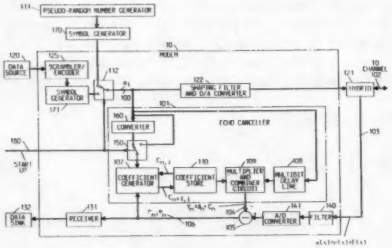
microphone and a tubular adaptor enclosing said microphone; said adaptor having a peripheral wall defining a cylindrical bore, an annular projection extending around said bore a predetermined distance from a front end of said bore; resiliently deformable means extending into said bore, said microphone being a snap insertion past said resiliently deformable means and being held between said resiliently deformable means and said annular projection; an end wall on said adaptor extending across said front end of said bore and defining a first volume between said microphone and said end wall; a hole extending through said end wall coaxial with said bore and a layer of accoustic material on said end wall on a surface remote from said first volume, said layer of accoustic material extending over said hole; said end wall positioned on said end surface of said tubular formation, said tubular formation defining a second volume between said inner surface of said front face and said end wall of said adaptor; and an aperture in said front face of said transmitter housing.

4,594,479

FAST START-UP OF ADAPTIVE ECHO CANCELER OR ECHO MEASUREMENT DEVICE

Cecil W. Farrow, Highlands, and Jack Salz, Fair Haven, both of N.J., assignors to AT&T Information Systems Inc. Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Aug. 18, 1983, Ser. No. 524,421
Int. Cl.[4] H04B *3/20*
U.S. Cl. 179—170.2 **18 Claims**



1. Apparatus for providing start-up of an echo canceler arranged to form replicas of the echo components included in respective received signals, said echo components resulting from application of respective data sequences to a transmission medium, said apparatus including:

means for storing a plurality of canceler coefficients,

means for generating as an individual one of said replicas a signal equal to the sum of the products of ones of said stored coefficients and elements of an applied one of said data sequences; and

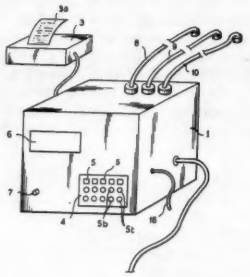
means for periodically updating said stored coefficients as a function of (1) the difference between said individual replica and its respective received signal, and (2) elements of a second data sequence which is orthogonal to said applied one sequence.

4,594,480

APPARATUS FOR AUTOMATICALLY CHECKING THE CORRESPONDENCE BETWEEN THE NUMERICAL CODES OF TELEPHONE SUBSCRIBERS AND THE DIFFERENT TRANSMISSION AND DISTRIBUTION IDENTIFICATION CODES OF THE TELEPHONE PAIR ASSIGNED TO EACH SUBSCRIBER

Claude Betton, Veneux les Sablons, France, assignor to Spie Batignolles, Puteaux, France

Filed Aug. 28, 1984, Ser. No. 644,958
Claims priority, application France, Sep. 2, 1983, 83 14064
Int. Cl.[4] H04B *3/46*
U.S. Cl. 179—175.3 R **19 Claims**



1. An apparatus for automatically checking the correspondence between the numerical codes of telephone subscribers and the different transmission and distribution identification codes of the pair of cables assigned to each subscriber, said apparatus being intended to be connected to the power supply system and to the connecting terminals of the transmission and distribution cables of a subdistribution frame, wherein said apparatus comprises:

means (**4, 5**) for successively entering into the apparatus the numerical codes and constitution numbers of subscribers from a data source of numerical codes and constitution numbers to be checked;

connectors (**8, 9, 10**) to be attached to the terminals of a subdistribution frame;

a test unit comprising a microprocessor (**23**) which is programmed for storing said numerical codes and constitution numbers entered into the apparatus and for initiating transmission of a coded signal to said transmission and distribution cables of the said pairs of cables to be tested, means for detecting said signal in order to check whether the designated constitution numbers correspond to the said pairs of cables to be tested;

means (**3**) for displaying the results of said test.

4,594,481

ELECTRONIC TOUCH PAD KEY ASSEMBLY WITH STROKE AMPLIFIER

Donald W. Wilham, and Richard A. Rowe, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 19, 1985, Ser. No. 746,528
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—5 A **5 Claims**

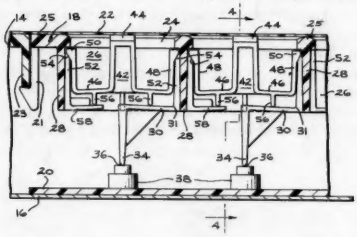
1. An electrical switch panel including a switch and a switch actuating assembly positioned for intermittently altering the electrical condition of said switch comprising:

a support member including a top wall supporting said switch actuating assembly, and a bottom wall for supporting said switch;

a base member arranged on said top wall in spaced relationship to said bottom wall, said base member including an opening defining a chamber;

an insulative film arranged on said base member providing a touch area covering said chamber opening;

actuating means disposed for axial movement in said chamber, and a movement amplifying lever arrangement in said



chamber, whereby axial movement of said film is transmitted through said actuating means and said movement amplifying lever arrangement to thereby amplify said axial movement of said film to alter the electrical condition of said switch.

4,594,482

INPUT ELEMENT WITH IMPROVED APPEARANCE AND RELIABILITY

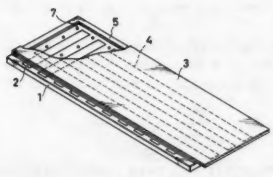
Tetsuro Saito, and Akihiko Komura, both of Hiratsuka, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1985, Ser. No. 692,209

Claims priority, application Japan, Jan. 23, 1984, 59-9732; Jan. 24, 1984, 59-10644

Int. Cl.⁴ H01H *13/02*

U.S. Cl. 200—5 A **7 Claims**



1. A panel switch, comprising a pair of transparent substrates one of which is flexible and comprises a flexible film and the other of which comprises a glass plate, each having electrodes of transparent electroconductive film on one surface, being arranged in confrontation with each other in such a manner that the surfaces provided with the electrodes face each other with a space therebetween, and a first spacer arranged at the peripheral portions of said pair of substrates to maintain said space, and reflective convex second spacers provided in dot form all over said one surface of said glass plate except for where the transparent electroconductive film is formed.

4,594,483

IMPULSE GENERATOR

Wolfgang Rösl, Eckental, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 17, 1984, Ser. No. 611,304

Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319404

Int. Cl.⁴ H01H *19/60*

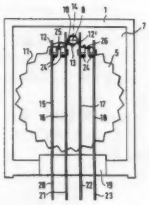
U.S. Cl. 200—6 B **9 Claims**

1. An improvement in an impulse generator, said impulse generator having two pairs of contacts disposed with respect to each other in a spaced relationship, an indexing element disposed between said pairs of contacts, said indexing element arranged and configured to be resiliently deflected toward either one of said two pairs of contacts and operable in combination with each pair of contacts to close a corresponding one of said pairs of contacts when said indexing element has been deflected toward said corresponding pair of contacts by a predetermined degree, and an indexing disk provided with a plurality of teeth and dihedral notches, said indexing disk disposed in operable engagement with said indexing element to deflect said indexing element toward a selected one of said two pairs of contacts, said improvement comprising:

wherein each pair of contacts is a contact spring assembly, each contact spring assembly being independent from another one of said two pairs of contacts;

wherein said indexing disk is disposed adjacent said pairs of contacts;

wherein said indexing element is a spiral spring, at least one



end of said spiral spring being fixed with respect to said two pairs of contacts, said spiral spring characterized by a longitudinal axis, said longitudinal axis disposed adjacent to and in a direction parallel to said dihedral notches defined in said indexing disk, said plurality of teeth and notches being alternately defined in said indexing disk, said indexing disk having a width and two adjacent teeth defining therebetween a dihedral notch, said teeth of said indexing disk contacting said spiral spring to deflect said spiral spring toward a selected one of said contact spring assemblies,

whereby said selected one of said contact spring assemblies is actuated, whereby abrasion of said spring and indexing disk is minimized, whereby positive engagement is effectuated with said spiral spring, and whereby reliable activation of said contact spring assembly is assured.

4,594,484

SWITCH BRIDGE ARRANGEMENT FOR AN ELECTRICAL SWITCH

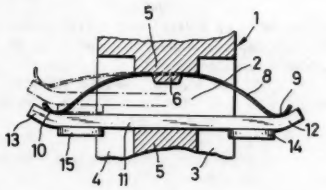
Helmut Lemmer, Marienheide-Kalsbach, Fed. Rep. of Germany, assignor to Square D Starkstrom GmbH, Marienheide-Rodt, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 713,267

Claims priority, application European Pat. Off., Mar. 31, 1984, 84103593.4; Oct. 24, 1984, 84112789

Int. Cl.⁴ H01H *3/02*

U.S. Cl. 200—16 A **13 Claims**



1. A switch bridge arrangement for safety switches, comprising a housing having at least one window; at least one

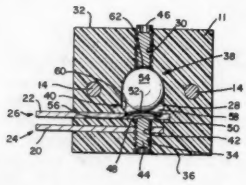
contact bridge movably positioned in said window and carrying at ends thereof contact pieces; and at least one contact spring, said contact bridge being under pressure of said spring, said spring being convexly curved with respect to said contact bridge and being formed as a leaf spring, said leaf spring having an arresting means, said housing in a region of said window having side walls and a wall portion, said arresting means cooperating with said wall portion to to be engaged therewith, said leaf spring having two opposite ends, said contact bridge also having two opposite ends, the two opposite ends of said leaf spring and the two opposite ends of said contact bridge being concavely curved in the same direction and cooperating with each other, said contact bridge being supported in a longitudinal direction thereof by said leaf spring in a transverse direction thereof by said side walls, said leaf spring being formed with two elongated slots extended toward the opposite ends thereof.

4,594,485

IMPACT SENSOR

Milton F. Brown, Jr., 1105 Hartwood Ave., Virginia Beach, Va. 23454

Filed Apr. 4, 1985, Ser. No. 719,877
Int. Cl.[4] H01H *35/14*
U.S. Cl. 200—61.45 R **22 Claims**



1. An impact sensor, comprising:
(a) a housing having an inner chamber;
(b) a first electrical contact has a contact portion projecting into said chamber;
(c) a second electrical contact in said housing is spaced from said first contact and has an aperture surrounding said contact portion;
(d) insulating means disposed between said contacts for maintaining electrical isolation of said contacts;
(e) a plastically deformed conductive arcuate spring means is in electrical connection with said second contact and is associated with said aperture and has a first position arched away from said contact portion and a second position arched toward and engaged with said contact portion for thereby establishing electrical connection between said contacts; and,
(f) a mass movably received within said chamber is engagable with said spring means for shifting said spring means from said first to said second position when said mass is subjected to a preselected force.

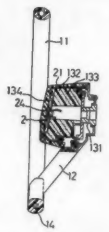
4,594,486

STEERING WHEEL PROVIDED WITH HORN SWITCH

Kazushi Noda, Inazawa, Japan, assignor to Toyoda Gosei Co., Ltd., Nishigasugai, Japan

Filed Feb. 14, 1985, Ser. No. 701,549
Claims priority, application Japan, Feb. 16, 1984, 59-20731[U]
Int. Cl.[4] H01H *9/00*
U.S. Cl. 200—61.54 **3 Claims**

1. A steering wheel provided with a horn switch for use in an automobile comprising:
a ring portion;
a boss portion positioned at the center of said ring portion;
a spoke portion connecting said boss portion to said ring portion;
a horn pad having a shock absorber provided on said boss portion and a cover member covering said shock absorber;
said horn switch being provided between an upper surface of said shock absorber and an under surface of said cover member; said horn switch comprising:
a base plate fixed to the upper surface of said shock absorber;
a horn plate positioned above said base plate so as to be opposed to said base plate; said horn plate being covered with said cover member;
a horn plate supporting means composed of a sheet spring member having a base portion and a plurality of foot portions, each foot portion obliquely extending upward from each end of said base portion, said foot portions supporting



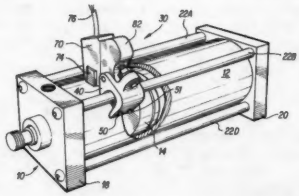
said horn plate in their ends; said base portion being fixed to said base plate through an insulating plate;
a horn plate stopping means for stopping said horn plate from moving upward beyond a predetermined distance from said base plate, overcoming a biasing force of said horn plate supporting means;
a plurality of fixed contact points provided in said base plate;
a plurality of movable contact points vertically moving with said horn plate and coming in contact with said fixed contact points; and
an electric power supplying means for electrically connecting said plurality of fixed contact points and said plurality of movable contact points to a horn and an electric power source.

4,594,487

MOUNTING MEANS FOR PROXIMITY SENSING DEVICE

Roman Grassl; Thomas A. Craig, both of Menomonee Falls, and Eric P. Weil, Milwaukee, all of Wis., assignors to Galland Henning Nopak, Inc., Milwaukee, Wis.

Filed Dec. 7, 1984, Ser. No. 679,535
Int. Cl.[4] H01H *35/38*
U.S. Cl. 200—82 E **19 Claims**



1. A mounting arrangement for supporting a proximity sensing means contiguous the outer peripheral surface of a fluid power cylinder, in which said fluid power cylinder is of the type comprising a cylinder body and a piston axially movable in said cylinder body, and in which said fluid power cylinder includes a pair of oppositely disposed end closures

respectively positioned at each of the respective opposite ends of said cylinder body, and tie rod means connecting said oppositely disposed end closures, said mounting arrangement comprising a sensing means support device adapted to be detachably mounted on said fluid power cylinder including a clamp member for detachable connection to said tie rod means and a swivel member, means pivotally connecting said swivel member to said clamp member, whereby said swivel member is pivotally adjustable relative to said clamp member for cylinders of different outer diameters, said swivel member being positionable in overlying relation to a portion of the outer peripheral surface of said cylinder body when said sensing means support device is mounted on said fluid power cylinder, said swivel member being adapted to support a sensing device contiguous said outer peripheral surface of said cylinder body.

4,594,488

HIGH-VOLTAGE ELECTRIC SWITCH WITH ARC EXTINGUISHING DEVICE USING SELF-GENERATION OF A QUENCHING PRESSURE

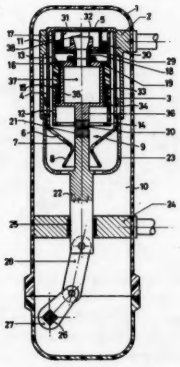
Gianpietro Talpo, Bergamo, Italy, assignor to Sace S.p.A. Costruzioni Elettromeccaniche, Bergamo, Italy

Filed May 6, 1985, Ser. No. 730,445

Claims priority, application Italy, May 10, 1984, 20871 A/84

Int. Cl.⁴ H01H *33/70*

U.S. Cl. 200—148 R **6 Claims**



1. A high-voltage electric switch with an arc extinguishing device using self-generation of a quenching fluid pressure, comprising a hermetically sealed insulating container filled with said quenching fluid and divided by an at least partly insulating separation wall into a compression chamber and a compensation chamber, contacts disposed in said compression chamber and a movable contact rod mobile through an aperture in said separation wall in order to connect together said two chambers after a determined path of its opening travel, said contacts disposed in the compression chamber being arranged to create, in cooperation with the movable contact rod during its opening travel, two arcs in succession, of which one is a primary auxiliary arc for generating the quenching fluid pressure for extinguishing a second main interruption arc, characterised in that the compression chamber has a fixed volume and is at least partly surrounded by fixed main contacts cooperating with mobile main contacts carried by said movable contact rod, there being disposed inside the compression chamber in a manner movable to a limited extent by the movable contact rod during its closure travel against the action of elastic means a first pair of cooperating arcing contacts designed to create the primary auxiliary arc and a second contact cooperating with the movable contact rod and designed to create the main interruption arc therewith, said arcing contacts being electrically in parallel with the main contacts and in series with each other.

4,594,489

ELECTRICAL SWITCHING ELEMENT

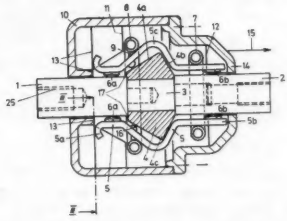
Bruno Gengenbach; Carl-Ludwig Meyer; Roland Michal, all of Pforzheim, and Ferenc Remenyi, Viernheim, all of Fed. Rep. of Germany, assignors to Doduco KG Dr. Eugen Durrwachter, Pforzheim, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 693,119

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 3402371; Jan. 25, 1984, 3402372

Int. Cl.⁴ H01H *33/06*

U.S. Cl. 200—151 **28 Claims**



1. A switching element, particularly for use as a load-isolating switch in low-voltage switchgear, which switching element comprises contact-bridging means for electrically connecting two stationary electrical terminals, characterized in that

the two terminals consist of respective electrodes (**1**, **2**), which are coaxial to each other and axially spaced apart and are mechanically connected by an insulator (**3**), which is coaxial to and disposed between said electrodes,

the contact-bridging means comprise at least one axially displaceable contact bridge (**5**), which carries two axially spaced apart, electrically interconnected contacts (**6***a*, **6***b*), which are engageable with the two electrodes (**1**, **2**) under the force of springs (**7**, **8**),

an electrically insulating cam (**4**) is provided on the insulator (**3**) under the or each contact bridge (**5**) and has an inclined surface (**4***a*) facing one end (**5***a*) of the or each contact bridge (**5**),

a slider (**10**) is provided, which is axially slidable along the axis of the electrodes (**1**, **2**) and comprises coupling elements (**13**, **14**) for acting on respective ends (**5***a*, **5***b*) of the or each contact bridge (**5**), said slider being reciprocable between a first position (FIGS. **1** and **4**), in which the or each contact bridge (**5**) is in contact with both electrodes (**1**, **2**), and a second position (FIGS. **2** and **6**), in which one contact (**6***a*) of the or each contact bridge (**5**) engages said cam (**4**) and is spaced from one of the electrodes (**1**), hereinafter described as the "first electrode", and

the or each contact bridge (**5**) is adapted to slide on said inclined surface (**4***a*) of said cam (**4**) during the movement of said slider (**10**) from said first position to said second position so as to disengage said contact bridge (**5**) from said first electrode (**1**).

4,594,490

TERMINAL PIN SHORTING SWITCH APPARATUS

Harold E. McCullough, Blacklick, Ohio, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 8, 1984, Ser. No. 669,661

Int. Cl.⁴ H01H *1/32*

U.S. Cl. 200—248 **10 Claims**

10. Apparatus (**1**) for use with equipment mounting backplane terminal pins comprising

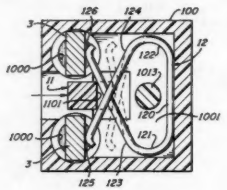
means for electrically shorting ones of the terminal pins together

characterized in that

said electrical shorting means comprises

an insulated housing member **(10)** having a chamber therein with apertures formed for slidably receiving a pair of the terminal pins,

an electrical shorting member **(12,13)** positioned in said insulated housing member chamber and formed with a common member **(120,130)** interconnecting a pair of helical springs **(121,122,131,132)** each extended into an independent cantilever spring **(123,124,133,134)** formed across



the other independent cantilever spring for normally engaging one of the terminal pins and compensating for terminal pin misalignment, and

an actuating member **(11)** rotatably positioned in said insulating housing member and having a lever member **(110)** extending outward at an angle from an upper surface of said insulating housing with a cam surface **(1101)** positioned between said crossed independent cantilever springs for disengaging said independent cantilever springs from said pair of terminal pins in response to rotation of said actuating member occasioned by engagement of connector apparatus with the pair of backplane terminal pins.

4,594,491

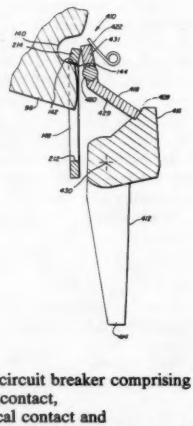
MOLDED CASE CIRCUIT BREAKER WITH A TRIP MECHANISM HAVING AN INTERMEDIATE LATCH LEVER

David A. Leone, Aliquippa, and Douglas C. Marks, N. Braddock, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1984, Ser. No. 655,954

Int. Cl.[4] H01H *3/00*

U.S. Cl. 200—325 **8 Claims**



1. An electrical circuit breaker comprising

a first electrical contact,

a second electrical contact and

operating means for moving said first and second electrical contacts into engagement and out of engagement, said operating means having an OPEN position, a CLOSED position and a TRIPPED position, said operating means comprising a movable cradle and a trip mechanism,

said trip mechanism comprising a trip bar having a latching surface, an intermediate latch having a first end for releasably engaging said cradle, and an intermediate latch lever having a first surface for engaging said intermediate latch and a second surface, remotely disposed from said first surface, for releasably engaging said latching surface of said trip bar,

said intermediate latch lever being pivotable about a pivot axis and including a first elongated portion disposed between said first surface of said intermediate latch lever and said pivot axis and a second elongated portion disposed between said second surface of said intermediate latch lever and said pivot axis, said first portion being substantially less in length than said second portion.

4,594,492

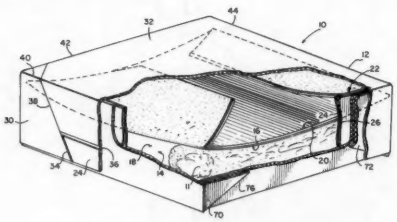
MICROWAVE PACKAGE INCLUDING A RESILIENTLY BIASED BROWNING LAYER

Raymond V. Maroszek, Neenah, Wis., assignor to James River Corporation, Norwalk, Conn.

Filed Jun. 4, 1984, Ser. No. 617,527

Int. Cl.[4] H05B *6/80*

U.S. Cl. 219—10.55 E **16 Claims**



1. A package for use in heating and browning food by microwave energy comprising:

a carton containing an interior food cavity;

a first browning means associated with said carton for converting microwave energy into heat for browning a surface of the food located within the interior food cavity; and

biasing means imposing a spring force on said first browning means to cause said first browning means to be urged positively into contact with the surface of the food within the interior food cavity and for maintaining said first browning means in forceful contact with the food and the food in forceful contact with an opposing surface in said interior food cavity of said carton during the microwave heating and browning.

4,594,493

METHOD AND APPARATUS FOR FORMING BALL BONDS

Shane Harrah, Palo Alto, and William Phy, Los Altos Hills, both of Calif., assignors to Fairchild Camera & Instrument Corp., Cupertino, Calif.

Filed Jul. 25, 1983, Ser. No. 517,190

Int. Cl.[4] B23K *31/00*

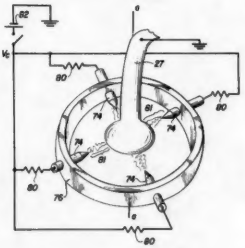
U.S. Cl. 219—56.22 **17 Claims**

15. A method for forming a ball bond between a wire and a surface, the ball bond being approximately radially symmetric about a principal axis of the wire, the method including the steps of:

symmetrically positioning a plurality of electrodes about a

tip of a wire, each electrode being connected in series with a resistance element and an arc path between each electrode and the tip of the wire;

applying a voltage source in parallel to each series combination of the electrode, the resistance element and the arc path;



essentially simultaneously producing an arc between the wire and the electrode to form the ball at the tip of the wire; and

placing the ball and the surface in contact with one another.

4,594,494

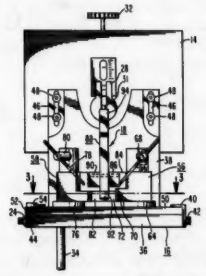
MODULAR WELDING APPARATUS HAVING TWO MOVABLE WELDING ELECTRODES

Dale V. Henry, West Lampeter Township, Lancaster County, and Donald B. Kaiser, Manor Township, Lancaster County, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 6, 1985, Ser. No. 698,785

Int. Cl.[4] B23K *9/32*

U.S. Cl. 219—86.8 **3 Claims**



1. In a modular welding apparatus comprising a welding assembly including a welding head with actuating means attached thereto, means for activating said welding head, a conductive base member spaced from said welding head, an interchangeable welding module having a conductive support plate detachably attached to said base member, and means for providing a first potential to said welding head and a second potential to said base member, the improvement wherein said interchangeable welding module comprises

two pre-aligned welding electrodes pivotably attached to said support plate, one of said welding electrodes being electrically connected to said base member and the other of said welding electrodes being electrically insulated therefrom, the other of said welding electrodes being electrically connected to said welding head, at least one of said welding electrodes being in communication with said actuating means, whereby movement of said actuating means provides pivotable movement of said welding electrodes.

4,594,495

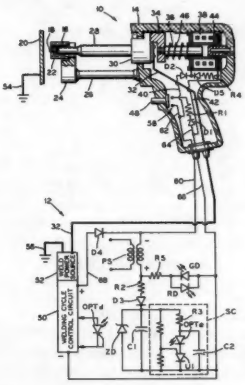
STUD WELDING APPARATUS WITH TWO-WIRE CONTROL

Paul A. Glorioso, Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 521,434, Aug. 8, 1983, abandoned. This application Mar. 6, 1985, Ser. No. 708,764

Int. Cl.[4] B23K *9/20*

U.S. Cl. 219—98 **14 Claims**



1. In stud welding apparatus for welding studs to workpieces, said apparatus comprising a welding tool having means for holding a stud, an electrical solenoid, a solenoid core connected to said stud holding means, a start switch, a welding cable electrically connected to said stud holding means independently of said solenoid coil, welding cycle controls remote from said stud welding tool having means for controlling the supply of power to said coil independently of the length of time said start switch is closed, means for supplying power to said welding cable independently of said solenoid coil to establish an arc between the stud and the workpiece when spaced apart, and means responsive to the closing of said start switch to cause said controlling means to initiate a welding cycle, the improvement comprising only two wires connecting said responsive means to said start switch and said controlling means to said start switch, whereby the same two wires connect said responsive means to said controlling means.

4,594,496

APPARATUS FOR INTRODUCING IONIZABLE GAS INTO A PLASMA OF AN ARC BURNER

Hans J. Bebber; Heinrich-Otto Rossner, and Gebhard Tomalla, all of Essen, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Nov. 9, 1983, Ser. No. 550,127

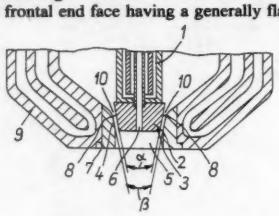
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241476

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121 PP **17 Claims**

1. In a plasma burner for introducing an ionizable gas stream into an electric plasma arc column, including a nozzle having an outlet opening for discharging said gas stream, said outlet opening being defined by an outlet part of said nozzle; said outlet part having an inner nozzle face conically tapering, at an acute first cone angle, in a direction of said outlet opening; an electrode including a frusto-conical terminal portion surrounded by said outlet part and having an outer electrode face frusto-conically tapering, at an acute second cone angle, in the direction of said outlet opening; said electrode face having a minimum diameter and a circumferential edge at said minimum

diameter; and a conical annular channel defined together by said inner nozzle face and said outer electrode face, the improvement wherein said nozzle is a sole nozzle, wherein said acute second cone angle is between 12° and 60°; wherein said circumferential edge surrounds a frontal end face of said electrode, said frontal end face having a generally flat configuration oriented generally radially relative to the outer electrode face; wherein the outlet opening of said nozzle has an area of a full circle substantially at a level of said circumferential edge; and further wherein said circumferential edge is recessed relative to said outlet opening at a distance which is at the most one third the length of said minimum diameter.



4,594,497

IMAGE PROCESSING WELDING CONTROL METHOD

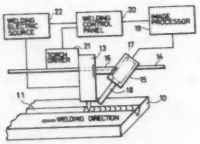
Youichi Takahashi; Koji Kashiwakura, both of Hitachi; Junichiro Morisawa, Ibaraki, and Masahiro Kobayashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,691

Claims priority, application Japan, May 23, 1984, 59-102588

Int. Cl.⁴ B23K *9/10*

U.S. Cl. 219—130.21 **6 Claims**



1. A welding controlling method using image processing comprising the steps of:

detecting a isothermal pattern having at least two isothermal lines, different in temperature, of a weld zone in the welding state;

detecting the existence of displacement of the centroid of said each isothermal line in a perpendicular direction to a welding direction;

controlling a relative position of a welding torch to a material to be welded such that said displacement is substantially zero is there is displacement, thereby to restore an optimum relative position of said torch to the material;

calculating the area of the region defined by one of said detected isothermal lines;

comparing said area with a preset reference area; and

controlling welding heat input such that these areas are substantially the same.

4,594,498

PULSE ARC WELDING MACHINE

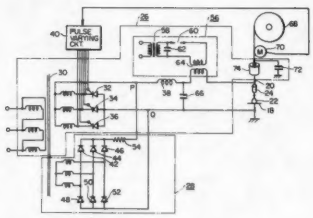
Shigeo Ueguri; Youichiro Tabata; Hirotsugu Komura, all of Hyogo, and Toshio Ito, Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1983, Ser. No. 534,540

Claims priority, application Japan, Mar. 31, 1980, 55-41354

Int. Cl.⁴ B23K *9/09*

U.S. Cl. 219—137 PS **14 Claims**



3. A method for operating a pulse arc welding machine of a type in which a wire electrode is fed by a welding torch confronting a base material in such a manner that the wire electrode is maintained spaced from the base material, comprising the steps of:

supplying a shielding gas to a welding area of said base material;

feeding a wire electrode to said welding torch;

supplying a base current between said wire electrode and base material;

supplying a pulse current between said wire electrode and said base material; and

varying a number of pulses per unit of time of said pulse current in proportion to a feeding speed of said wire electrode;

wherein, said wire electrode is soft steel wire having a diameter of 1.2 mm and said shielding gas comprises Ar and CO_2 in a ratio of 8:2, and a peak value I_p of said pulse current is set in accordance with:

$$I_p \geqq 370A, \text{ and}$$

$$1.2/\tau \leqq I_p \leqq 2.42/\tau,$$

where τ is a width of said pulses in milliseconds.

4,594,499

APPARATUS FOR PRODUCING A LINE OF SEPARATION IN A PLASTIC WORK SURFACE

Colin Rapsey, Watford, and John H. Elworthy, Whaddon, both of England, assignors to Protocol Engineering Limited, Berkhamsted, England

Filed Jan. 20, 1984, Ser. No. 572,299

Claims priority, application United Kingdom, Jan. 21, 1983, 8301710

Int. Cl.⁴ H05B *3/00, 1/02;* B62D *7/10*

U.S. Cl. 219—221 **12 Claims**

1. Apparatus for producing a line of separation in a work surface of plastic and the like, comprising:

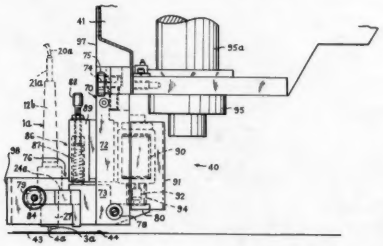
a work support-surface for supporting a work surface of plastic and the like;

a head movably mounted above said work support-surface for movement in orthogonal directions across said work support-surface;

a mounting arrangement mounted on and dependent from said head;

a tool for forming a line of separation in a work surface, said tool being releasably supported in said mounting arrangement and including a tool member having a separating point for effecting a line of separation, a tool body having

a holder for said tool member, said holder being made of a heat-conductive material, and a heating element associated with said tool body, said heating element and said holder being positioned such that heat is conducted from said heating element to said holder and said tool member, and from said holder to said tool member, said holder releasably receiving a portion of said tool member remote from said separating point, said tool member being positioned relative to said tool body such that a portion thereof projects from said tool body and said holder to said separating point, said projecting portion extending in freely-exposed manner from said body and said holder such that a work surface may be engaged solely by said point, said point including a tip and a surrounding surface extending therefrom in divergently inclined manner; and



said mounting arrangement including a pivot and a pivotable lever spaced above said work support-surface and extending on opposite sides of said pivot, said pivot forming a pivot axis for said pivotable lever extending transversly of said work support-surface, a portion of said lever at one side of said pivot forming a clamp arm releasably securing said tool with said separating point extending below and remotely from said clamp arm towards said work support-surface, and a portion of said lever on an opposite side of said pivot forming an actuating arm, actuator means engaging said actuating arm for moving said actuating arm in at least one sense about said pivot to bring said separating point into and out of contact with work on said work support-surface.

4,594,500

ELECTRICALLY HEATED PUMP FOR SPAS AND SWIMMING POOLS

Murray J. Wright, Christchurch, New Zealand, assignor to Wright Spa Pools Ltd, Christchurch, New Zealand, a part interest

Filed Feb. 7, 1983, Ser. No. 464,423

Claims priority, application New Zealand, Feb. 10, 1982, 199682

Int. Cl.[4] H05B *1/02;* **F24H** *1/10;* **F04B** *21/00;* **E04H** *3/20*

U.S. Cl. 219—296 **9 Claims**

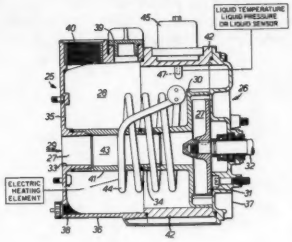
1. A swimming pool and spa pump, including a fabricated housing containing:

(a) a first housing part having a volute portion define a suction chamber in which is mounted to a pump impeller, said suction chamber having an outlet therefrom and said volute portion having a boss defining an inlet to said suction chamber;

(b) a second housing part having a discharge outlet and a tubular inlet;

(c) a sleeve extending between said tubular inlet and said volute boss to define a suction inlet to said suction chamber;

(d) a body extension disposed between the first and second housing parts to define a pressure chamber surrounding said suction inlet and said suction chamber and being in communication with said suction chamber outlet and the discharge outlet;



(e) a heating element within said housing adapted to heat liquid flowing therethrough.

4,594,501

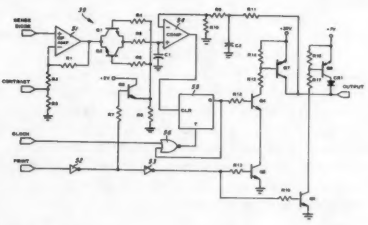
PULSE WIDTH MODULATION OF PRINTHEAD VOLTAGE

Paul R. Culley, and Steven J. Wallace, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 9, 1980, Ser. No. 195,557

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—492 **11 Claims**



1. An electronic thermal printing terminal having a system clock, an available DC power source, and a thermal printhead selectively activated during the print cycle, the printhead including a temperature sense diode, comprising:

(a) power transistor switching means connected to the DC power source and to the thermal printhead;

(b) control timing means comprising a latch circuit having an output electrically connected to the control electrode of the power transistor switching means, an input connected to receive signals from the system clock, and a reset input for clearing the latch circuit, for permitting the power transistor switching means to close and open, thereby respectively connecting and disconnecting the thermal printhead from the DC power source;

(c) duty cycle varying means having an output connected to the reset input for activating the control timing means to vary the time of the power transistor switching means to be opened and closed within a fixed cycle time, and connected to receive the output of the temperature sense diode as a reference voltage; and

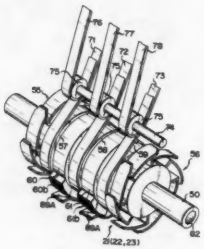
(d) pulse integrating means connected to be printhead for providing a voltage indicative of power applied to the printhead, and connected to the duty cycle varying means to activate the duty cycle varying means when the indicative voltage reaches the reference voltage, and to deactivate the duty cycle varying means when the indicative voltage drops below the reference voltage.

4,594,502

AUTOMATIC DEPOSITING/DISPENSING APPARATUS

Yoshihiro Watanabe, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 9, 1983, Ser. No. 502,657
Claims priority, application Japan, Jun. 16, 1982, 57-103331
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 9 Claims



1. An automatic depositing/dispensing apparatus which stores deposited notes together with previously stored notes and appropriates the deposited notes for dispensation, comprising:

a housing having a note inlet and a note outlet;

a plurality of note storage means in the housing each for storing deposited notes of a denomination;

first conveyor means for transferring notes inserted in the note inlet to the individual note storage means; and

second conveyor means for transferring to the note outlet notes taken out of the individual note storage means,

each said note storage means including a note storage chamber for storing notes, and collection/takeout means provided on one side of the note storage chamber and disposed between said first conveyor means and said note storage chamber, said collection/takeout means for receiving, at one portion of said one side, the deposited notes from the first conveyor means to collect the same in the note storage chamber, and for taking out, at the other portion of said one side, the notes collected in the note storage chamber to deliver the same to the second conveyor means, wherein

said collection/takeout means includes a pair of vane wheels coaxially rotating in one direction, each said vane wheel having a rotating body and a plurality of vanes arranged circumferentially along the periphery of the rotating body and extending in the other direction opposite to said one direction, so that the notes transferred in said one direction by the first conveyor means are held between the vanes, and a takeout rotor coaxial with the vane wheels and having not attraction means on the peripheral surface thereof.

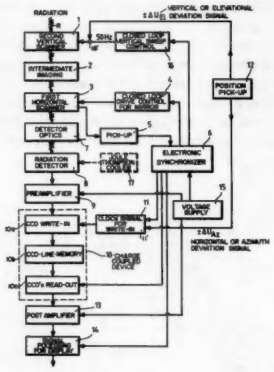
4,594,503

APPARATUS FOR STABILIZING THE SCANNING DIRECTION IN AN IMAGE FIELD SCANNING DEVICE

Fridbert Kilger, Munich; Siegfried Roth, Ottobrunn; Rupert Breithaupt, Egmating; Jupp Menke, Gluecksburg, and Günter Zeifang, Neckargemuend, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Oct. 27, 1983, Ser. No. 545,788
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241752
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—203 R 4 Claims

1. A circuit arrangement for stabilizing the scanning direction of an image field scanning device subject to motions, comprising first scanning means (3) for scanning an image in one direction, second scanning means (1) for scanning the image in a second direction, said first and second directions extending substantially perpendicularly to each other, first and second control means operatively connected to said respective first and second scanning means for controlling the scanning operation, pick-up means (12) for sensing position disalign-



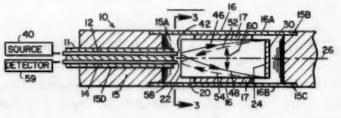
ments caused by said motion to produce at least one deviation signal signifying a deviation of a central viewing direction, signal combining means, conductor means operatively connecting one input of said signal combining means to the respective control means and another input of said signal combining means to an output of said pick-up means for combining said deviation signal with a control signal.

4,594,504

LIGHT MODULATION SENSOR IN A VORTEX SHEDDING FLOWMETER

Thomas P. Coursolle, St. Paul, and Patrick J. Murphy, Winsted, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Sep. 8, 1983, Ser. No. 530,200
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 11 Claims



1. A sensor for a vortex shedding flowmeter, the sensor comprising:

a light source;

a light detector;

a sensor housing which includes a vortex shedding body for inducing vortices in a fluid on first and second opposite sides of the body which are representative of flow of the fluid, the sensor housing having a cavity which extends therethrough from the first to the second side;

first and second diaphragms supported on the first and second sides of the sensor housing in generally parallel relationship, the diaphragms covering the cavity and being positioned with respect to the vortex shedding body to respond to pressure differentials caused by the vortices induced in the fluid by the vortex shedding body;

reflector means positioned within the cavity for reflecting light;

waveguide means extending through the sensor housing to the cavity for transmitting light from the light source toward the

reflector means and for transmitting light received after reflection from the reflector means to the light detector;

lens means positioned between the waveguide means and the reflector means for directing light from the waveguide means to the reflector means and for focusing the light reflected by the reflector means to a position proximate the waveguide means, the light received by the waveguide means after reflection by the reflector means being a function of relative positions of the waveguide means, the reflector means, and the lens means; and

coupling means connected between the first and second diaphragms for coupling movement of the diaphragms to at least one of the reflector means, the waveguide means, and the lens means so that light received by the waveguide means after reflection by the reflector means is a function of pressure differentials which cause deflection of the first and second diaphragms.

4,594,505

PHOTOELECTRIC KEY SWITCH DEVICE WITH NOTCHED ROTOR

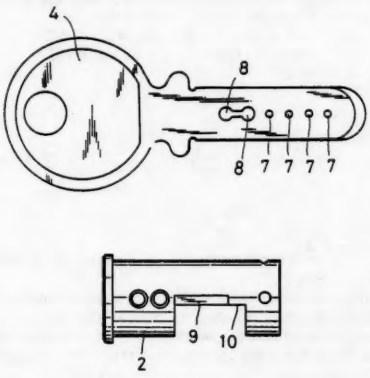
Naoyuki Sugimoto, Koganei, Japan, assignor to Takigen Seizou Co. Ltd., Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,950

Claims priority, application Japan, Nov. 10, 1983, 58-174017

Int. Cl.[4] E05B *35/00*; H01H *27/00*

U.S. Cl. 250—229 **4 Claims**



1. A photoelectric key switch device comprising:

a lock main body;

a rotor incorporated in said lock main body;

a lock member for locking said rotor to said lock main body so that said rotor can not be rotated;

a key inserted into said rotor and driving said lock member to unlock said rotor;

a group esch of light-emitting elements and light-receiving elements, arranged on both sides of said lock main body in such a manner as to oppose one another,

said rotor being disposed so as to intercept the passage of light from said light-emitting elements to said light-receiving elements;

a group of light transmitting portions and/or light intercepting portions disposed on said key in such a manner as to correspond to the arrangement of said light-emitting and light-receiving elements;

a notch formed on said rotor so that when said key is inserted into said rotor and said rotor is rotated by a predetermined angle, said notch forms optical paths between all of the elements of said group of light-emitting and light-receiving elements except one set of said elements; and

another notch formed on said rotor so that when said rotor is further rotated by an angle α, said another notch forms an optical path between said one set of elements.

4,594,506

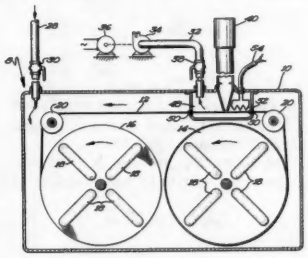
GAS CHROMATOGRAPH/MASS SPECTROMETER INTERFACE

Sahba Ghaderi, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Sep. 10, 1984, Ser. No. 648,518

Int. Cl.[4] H01J *47/04*

U.S. Cl. 250—288 **23 Claims**



1. Apparatus for obtaining a mass spectrometer sample from the effluent of a gas chromatograph, the sample being essentially devoid of any chromatograph carrier gas, the apparatus comprising:

recording means located within a housing;

means introducing the gas chromatograph effluent into the housing;

cooling means lowering the temperature of the recording means for freezing the non-carrier gas portion of the effluent on the surface of the recording medium; and

means for removing the carrier gas portion of the effluent from the housing.

4,594,507

THERMAL IMAGER

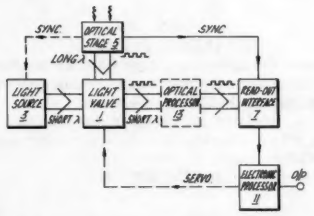
Charles T. Elliott; Richard G. Humphreys, and Rex Watton, all of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 24, 1984, Ser. No. 653,725

Claims priority, application United Kingdom, Oct. 14, 1983, 8327552

Int. Cl.[4] G02F *1/13*

U.S. Cl. 250—331 **29 Claims**



17. A thermal imager arranged for parallel readout including: a light valve responsive to absorption of infrared radiation by variation in reflectivity or transmittivity at shorter wave lengths, imaging means for imaging a thermal scene onto the light valve, modulating means arranged for intensity modula-

tion of radiation from the scene falling on the light valve, a light source arranged for illumination of the light valve's responsive region, means for detecting light from the source after passage via the light valve, and electronic processing means arranged to provide an output signal indicating changes in detected light intensity produced by modulation of radiation from the scene received by the light valve, the detecting means including an array of detectors each arranged to monitor a respective light valve sub-region, the light source being arranged to illuminate simultaneously all of the light valve's infrared responsive region, and including a heat sink uniformly coupled to the light valve responsive region via a high thermal impedance.

4,594,508

RADIATION SCANNING SYSTEMS

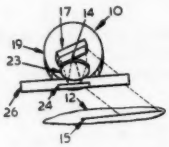
Herbert M. Runciman, Glasgow, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Filed Nov. 27, 1984, Ser. No. 675,391

Claims priority, application United Kingdom, Dec. 6, 1983, 8332531

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 250—334 **10 Claims**



1. A radiation scanning system incorporating a radiation scanning device for transferring radiation between radiation-transmitting and radiation-receiving stations with simultaneous mapping of a point in one station to a line in the other station when said other station is in the form of a distant plane, said device having at least one mirror mounted on a carrier for movement about an axis and being arranged with said movement axis lying in the plane of the angular offset between the radiation beams at said device incoming from and outgoing to said stations, wherein a refractive prism corrector is located in the path of the radiation beam between said device and said other station, the vertex edge of said prism corrector being perpendicular to said movement axis, the prism corrector being such that at least one point in said one station maps into a straight line in said other station.

4,594,509

INFRARED SPECTROMETER

Arno Simon, Ettlingen, and Jürgen Gast, Rheinstetten, both of Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 574,862

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1983, 3303140

Int. Cl.⁴ G01J *1/00*

U.S. Cl. 250—338 **31 Claims**

1. An infrared spectrometer comprising:

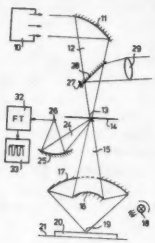
a source for generating a first beam of infrared radiation;

first optical means for focusing said first beam in an approximately point-shaped area upon the surface of a sample under investigation;

an infrared light-sensitive detector;

second optical means for focusing upon said detector at least a portion of a second beam of infrared radiation reflected from said area upon indication of said first beam;

visual observation means for visually viewing said area; and



third optical means arranged for reflecting at least a portion of said second beam onto said visual observation means.

4,594,510

HEAT ENERGY MEASURING SYSTEM

Chris W. Brown, 192 Fleetwood Dr., Saunderstown, R.I. 02874; Mark A. Maris, 54 Great Rd., Acton, Mass. 01720; Donald S. Lavery, 4225 Ruskin, Houston, Tex. 77005; Bernard Caputo, Sprucewood Cir., Boxford, Mass. 01921, and Mark Model, 31 Englewood Ave., Brookline, Mass. 02146

Filed Mar. 1, 1985, Ser. No. 707,265

Int. Cl.⁴ G01N *21/31, 21/35, 33/22*

U.S. Cl. 250—339 **39 Claims**

1. A system for measuring the heat energy of a combustible fluid comprising:

means for directing radiation through a sample of the fluid;

means for detecting the absorbance of at least one combustible component of the combustible fluid at a selected spectral line, there being at least one spectral line for each combustible component to be examined in the fluid;

means for combining at least one heat energy proportionality factor with the absorbance at each spectral line; and

means for summing said combinations to determine the heat energy of the fluid.

4,594,511

METHOD AND APPARATUS FOR DOUBLE MODULATION SPECTROSCOPY

David E. Cooper, Palo Alto, Calif., and Thomas F. Gallagher, Charlottesville, Va., assignors to SRI International, Menlo Park, Calif.

Filed Mar. 29, 1985, Ser. No. 717,356

Int. Cl.⁴ G01N *21/27, 21/00*

U.S. Cl. 250—339 **63 Claims**

1. Apparatus for detecting a spectral feature of a sample, said feature having a characteristic width, comprising:

a source of a generally monochromatic beam of light having a characteristic linewidth at most comparable with the width of said spectral feature;

modulation means for modulating said beam at first and second modulation frequencies related to one another so as to provide a plurality of sidebands including a first, probe group and a second, reference group of component sidebands offset from one another within each group by a characteristic offset frequency at most comparable with

the width of said feature, said probe and reference groups being disposed in frequency at said spectral feature and remote from said spectral feature, respectively;

a photodetector disposed to receive said beam after interaction with said sample, said photodetector providing an output signal representative of the received beam; and

detection means connected to receive said output signal and detect therein a component signal at said characteristic offset frequency representative of said spectral feature.

4,594,512

IONIZATION TYPE SMOKE DETECTOR

Toru Sasaki, Tokyo, Japan, assignor to Nohmi Bosai Kogyo Co. Ltd., Tokyo, Japan

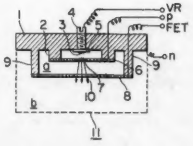
PCT No. PCT/JP83/00187, § 371 Date Jan. 10, 1984, § 102(e) Date Jan. 10, 1984, PCT Pub. No. WO83/04449, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 7, 1983, Ser. No. 573,923

Claims priority, application Japan, Jun. 7, 1982, 57-83510[U]

Int. Cl.⁴ G01T *1/18*

U.S. Cl. 250—384 **3 Claims**



1. An ionization type smoke detector comprising:

an inner electrode containing an opening;

an intermediate electrode containing an opening;

an inner ionization chamber;

said inner electrode and said intermediate electrode bounding said inner ionization chamber;

an outer electrode;

an outer ionization chamber;

said intermediate electrode and said outer electrode bounding said outer ionization chamber;

a single radioactive source for ionizing air present in both said inner and said outer ionization chambers;

a substrate containing a wall member supporting said inner electrode;

said radioactive source being enclosed by said inner electrode, said substrate and said wall member of said substrate;

a member adjustable relative to said substrate;

said radioactive source being disposed on said member; and

said inner and said outer ionization chambers being irradiated by ionizing radiation emitted by said radioactive source through said openings of said inner and intermediate electrodes emitted by said radioactive source.

4,594,513

MULTIPLEX DESIGN CONTAINER HAVING A THREE-LAYERED WALL STRUCTURE AND A PROCESS FOR PRODUCING THE SAME

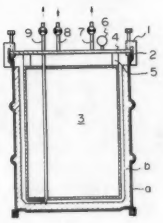
Osamu Suzuki; Kanjiro Ishizaki, both of Saitama, and Seiichi Ozawa, Tokyo, all of Japan, assignors to Chichibu Cement Co., Ltd. and Ozawa Concrete Industry Co., Ltd., both of Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 473,132

Claims priority, application Japan, Nov. 8, 1982, 57-195758

Int. Cl.⁴ G21F *5/00*

U.S. Cl. 250—506.1 **14 Claims**



1. A high-capacity and high integrity durable and resistent container for the burial and disposal of hazardous waste materials below ground, said container comprising

a metallic vessel as an outer layer;

a high-strength concrete lining formed of a cement paste comprising a mixture of cement and water, and optionally sand and aggregate, said high-strength concrete lining being formed on the inner surface of the metallic vessel and being reinforced with a reinforcing material, said reinforcing material optionally comprising metal fibers present in an amount no greater than about 2% by Vol., and said high-strength concrete lining being dried with the removal therefrom of evolved water vapor and the creation of a thin gap between said metallic vessel and said concrete lining due to the shrinkage of said lining during the drying thereof, and said high-strength concrete lining being impregnated with a solidified liquid impregnant;

a thin, continuous solidified barrier layer formed as a continuous intermediate layer in the thin gap between said metallic vessel and said concrete lining, said barrier layer consisting of said impregnant and being integral with the impregnant within said concrete lining, said thin continuous barrier layer constituting a barrier to the penetration of chemicals, water and acids,

whereby upon burial of said high-integrity container and corrosion over time of said metallic vessel, said high-strength concrete lining with said barrier layer retains its integral self-supporting shape and condition of being impact resistant, durable, mechanically strong and water tight.

4,594,514

COPPERPLATE PRINTING DETECTION METHOD AND DEVICE THEREFOR

Thomas Sidler, St. Aubin, and Daniel Gasser, St. Blaise, both of Switzerland, assignors to Compagnie Industrielle Radioelectrique, Switzerland

Filed Jan. 31, 1983, Ser. No. 462,338

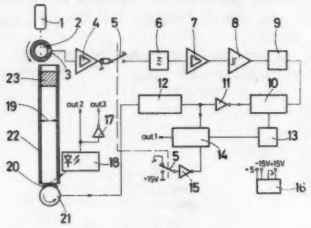
Claims priority, application Switzerland, Mar. 8, 1982, 1395/82

Int. Cl.⁴ G06K *5/00*

U.S. Cl. 250—556 **6 Claims**

1. Device for indentifying a banknote, which comprises a light source illuminating the carrier with an angle of incidence within the range of 45° to 80°, a disc comprising alternately transparent and opaque radial sectors, a motor for rotatably driving said disc, a fixed photoelectric pick-up mounted in

close proximity of said disc on the side thereof opposite said carrier and having a sensitive surface area covering several sectors of said disc, a lens disposed between the illuminated carrier and the disc for forming an image of the illuminated



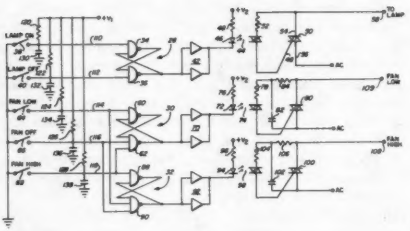
portion of said carrier on said photoelectric pick-up, and circuit means for detecting the periodic variation of the current delivered by said photoelectric pick-up which corresponds to the presence of a copperplate printing.

4,594,515

SWITCHING CIRCUIT

Roger L. Hummel, El Paso, Tex., assignor to Universal Metal Industries, Phoenix, Ariz.

Filed Jun. 11, 1984, Ser. No. 619,718
Int. Cl.[4] H03K *17/72*; *17/969*
U.S. Cl. 307—252 B **16 Claims**



1. A switching circuit having a plurality of inputs each capable of assuming first and second logic states and a plurality of outputs responsive to the respective states of said plurality of inputs, each of said outputs for controlling the application of a source of power to a load, comprising:

first logic means having a first output capable of assuming first and second logic states and having first and second inputs each also capable of assuming first and second logic states, said first output assuming said first logic state when said first input is in said first logic state and said second input is in said second logic state, and assuming said second logic state when said first input is in said first or second logic state and said second input is in said first logic state;

second logic means having a second output capable of assuming first and second logic states and having third, fourth and fifth inputs each also capable of assuming first and second logic states, said second output assuming said first logic state when said third input is in said first logic state and said fourth and fifth inputs are in said second logic state, and for assuming said second logic state when said third input is in said first or second logic state and at least one of said fourth and fifth inputs is in said first logic state; and

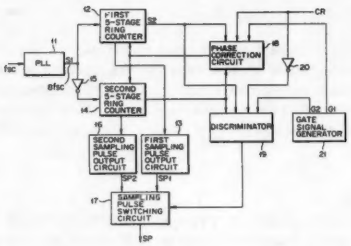
third logic means having a third output capable of assuming first and second logic states and having said third, fourth and fifth inputs, said third output assuming said first logic state when said fifth input is in said first logic state and said third and fourth inputs are in said second logic state, and assuming said second logic state when said fifth input is in said first or second logic state and at least one of said third and fourth inputs is in said first logic state.

4,594,516

SAMPLING PULSE GENERATOR

Shigenori Tokumitsu, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 27, 1983, Ser. No. 517,743
Claims priority, application Japan, Jul. 30, 1982, 59-133572
Int. Cl.[4] H03K *5/13*; H03L *7/00*
U.S. Cl. 307—269 **2 Claims**



1. A sampling pulse generator comprising:

signal output means for generating a first signal having a predetermined frequency;

a first ring counter coupled to said signal output means and driven by the first signal so as to produce a second signal obtained by frequency-dividing the first signal at a predetermined frequency dividing ratio;

inverting means, coupled to said signal output means, for inverting the first signal and providing an inverted signal;

a second ring counter coupled to said inverting means and driven by said inverted signal so as to produce a third signal obtained by frequency-dividing the inverted signal at a predetermined frequency dividing ratio;

sampling pulse output means, coupled to said first and said second ring counters, for producing a plurality of sampling pulses for sampling a signal to be sampled, the sampling pulses being obtained using the second and third signals such that the sampling pulses are phase-shifted by half a period of the first signal;

pulse generating means for generating a pulse having a predetermined level during a predetermined period of the signal to be sampled;

phase correcting means, coupled to said first and said second ring counters and to said pulse generating means, for performing phase correction so as to synchronize a count operation of said first and second ring counters with the signal to be sampled during a period of the pulse from said pulse generating means, the phase correction being performed such that the phases of the second and third signals are shifted in units of the period of the first signal so as to cause the second and third signals to have a first predetermined phase relationship between them, and each to have a second predetermined phase relationship with the signal to be sampled;

discriminating means, coupled to said first and said second ring counters and to said pulse generating means, for setting a plurality of discrimination periods obtained by dividing a maximum phase error against said second predetermined relationship between the second or the third signal and the signal to be sampled by half the period of the first signal when the phase correction by said phase correction means is completed, and for discriminating

which one of the plurality of discrimination periods corresponds to a phase-corrected second signal or a phase-corrected third signal; and

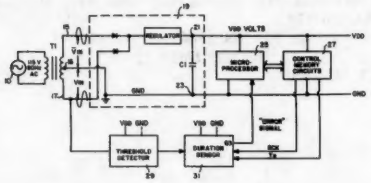
sampling pulse selecting means, coupled to said sampling pulse output means and to said discriminating means, for selecting a sampling pulse among the plurality of sampling pulses which has an optimal phase for sampling the signal to be sampled according to a discrimination result.

4,594,517

POWER DOWN SENSOR

William R. Cohen, North Plainfield Borough, and James E. Gillberg, Raritan Township, Hunterdon County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1984, Ser. No. 605,241
Int. Cl.[4] H03K *17/22*
U.S. Cl. 307—296 R **10 Claims**



1. In a system adapted to receive an alternating current (AC) supply voltage which normally changes its direction at regular intervals and alternates positively and negatively about a reference voltage, a circuit for detecting a reduction in the amplitude of the AC supply voltage comprising:

means responsive to the unrectified and unfiltered amplitude of the AC supply voltage for sensing its amplitude relative to said reference voltage and for producing a pulse whose width is proportional to the period of time the amplitude of the AC supply voltage is less negative than a first threshold level below said reference potential and less positive than a second threshold level above said reference potential; and

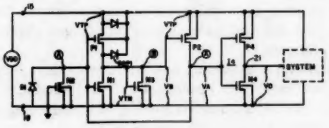
means for sensing the duration of said pulse for producing an error signal when the duration of said pulse exceeds a predetermined time period.

4,594,518

VOLTAGE LEVEL SENSING CIRCUIT

Robert G. Pollachek, Vancouver, Wash., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 6, 1984, Ser. No. 628,302
Int. Cl.[4] H03K *5/153*
U.S. Cl. 307—350 **10 Claims**



1. The combination comprising:

a first threshold circuit, having an input means and an output terminal, said first threshold circuit being responsive to an input voltage of greater amplitude than a first level for coupling to its output terminal an output voltage corresponding to said input voltage;

means coupled to said output terminal of said first threshold circuit for limiting the voltage at said output terminal to a first value;

a second threshold circuit, having an output terminal, said second threshold circuit being responsive to said input voltage being greater than said first value by a second value for producing at its output terminal an output voltage corresponding to said input voltage when the amplitude of said input voltage exceeds the sum of said first and second values; and

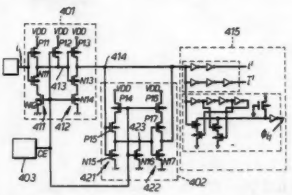
feedback means coupled between the output of said second threshold circuit and said input means of said first threshold circuit for interrupting current flow through the output terminal of said first threshold circuit when said second threshold circuit produces an output voltage corresponding to said input voltage.

4,594,519

LOW POWER CONSUMPTION, HIGH SPEED CMOS SIGNAL INPUT CIRCUIT

Takayuki Ohtani, Tokyo, and Tetsuya Iizuka, Chiba, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 22, 1983, Ser. No. 534,691
Claims priority, application Japan, Oct. 25, 1982, 57-187278
Int. Cl.[4] H03K *19/003, 19/094, 19/20*
U.S. Cl. 307—443 **9 Claims**



1. A CMOS signal input circuit having first and second voltage terminals with a current flow therebetween, comprising:

input gate means for (a) receiving an input signal and for providing an output voltage level at an output terminal in response to said input signal, (b) receiving an enable control signal which transitions between two possible logic states including an "enable" state and a "disable" state, and (c) interrupting said current flow when said enable control signal is in said "disable" state, said input gate means including:

a first gate controlled by said input signal and having an output;

a first MOS transistor having a first type channel and coupled in series with said first gate between said first voltage terminal and said second voltage terminal, said first MOS transistor being controlled by said enable control signal;

a second gate having an input and controlled by said output of said first gate and providing said output voltage level of said input gate means;

a second MOS transistor having a first type channel and coupled in series with said second gate between said first voltage terminal and said second voltage terminal, said second MOS transistor being controlled by said enable control signal; and

a third MOS transistor, having a second type channel which is a type opposite to said first type channel, connected between said input of said second gate and said second voltage terminal, said third MOS transistor being controlled by said enable signal; and

holding means coupled to said output terminal of said input gate means and enabled during the disabled state of said enable control signal, for holding the value of said output terminal to a voltage level which is attained at a time

period substantially immediately before said transition of said enable control signal from said "enable" state to said "disable" state.

4,594,520

LINEAR PULSE MOTOR

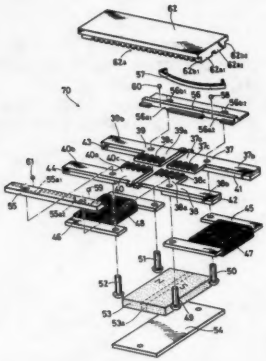
Zenichiro Miwa, and Hiroshi Nakagawa, both of Mie, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,796

Claims priority, application Japan, Apr. 26, 1984, 59-85958; Apr. 26, 1984, 59-85959

Int. Cl.[4] H02K *41/02*

U.S. Cl. 310—12 **17 Claims**



1. A linear pulse motor comprising:

(A) a flat primary body including a pair of first magnetic circuit forming means provided with coil means;

(B) a flat secondary body including second magnetic circuit forming means;

(C) said flat primary body and said flat secondary body being in parallel planes to each other and the one being movable relative to the other in one axis of direction;

(D) said first magnetic circuit forming means each having two head portions and two leg portions being substantially parallel to each other;

(E) first plural teeth being formed at constant pitch (P) in said head portions respectively;

(F) said pair of first magnetic circuit forming means being so arranged that said head portions are concentrated to one another;

(G) second and third plural teeth being formed at the same constant pitch (P) as said first plural teeth and in parallel rows, in said second magnetic circuit forming means, said second and third plural teeth being shifted from each other by a predetermined length;

(H) the groups of said first plural teeth being shifted from one another in a predetermined order by a quarter of the constant pitch (¼P) with respect to said second and third plural teeth;

(I) a permanent magnet being so contacted with said head portions of the pair of first magnetic circuit forming means that the two head portions of one of the first magnetic circuit forming means are N-polarized and those of the other of the first magnetic circuit forming means are S-polarized;

(J) guide means for guiding said one of the primary body and the secondary body movably in said one axis of direction, arranged between said primary body and said secondary body for maintaining the constant air gap between said first plural teeth, and said second and third plural teeth; and

(K) the axes of said coil means around which said coil means are wound being substantially perpendicular to said constant air gap.

4,594,521

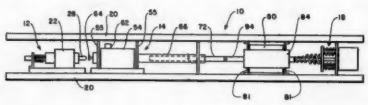
REPEATABLE EXPLOSIVE-DRIVEN PULSE GENERATOR SYSTEM AND METHOD

Rex L. Schlicher, 7420 Painted Pony Trail, NW., Albuquerque, N. Mex. 87120

Filed Nov. 15, 1984, Ser. No. 671,394

Int. Cl.[4] H02K *33/00*

U.S. Cl. 310—15 **3 Claims**



1. A repeatable explosive-driven electrical pulse generator system, comprising:

a. an explosive propellant driver having input and output ends and disposed for receiving an impact at said input end for causing explosion of a propellant and expansive release of chemical energy, said driver operable for converting said released chemical energy into mechanical driving motion at said output end;

b. a permanent magnet linear generator having means defining a magnetic circuit, a permanent magnet means coupled to said output end of said driver and supported for movement along a generally linear path with respect to said magnetic circuit and means coupled to said magnetic circuit for generating an electrical pulse in response to movement of said permanent magnet means;

c. a braking and recovery mechanism for capturing residue kinetic energy of said moving permanent magnet means and returning said permanent magnet means to its initial position; and

d. an explosive actuator disposed adjacent said driver and being operable for impacting said input end of said driver, said explosive actuator including:

a pair of spaced-apart solenoid devices having respective plungers mounted for parallel reciprocable movement;

a hammer disposed between said solenoid devices and mounted for reciprocable movement parallel to said plungers;

a transverse extending link interconnecting corresponding one ends of said plungers and said hammer;

reset means connected to said link and being resiliently extendable and retractable; and

switch means movable between an activated condition for energizing said solenoid devices to cause forward actuating movement of said plungers and said hammer and therewith extension of said reset means, and a deactivated condition for deenergizing said solenoid devices to allow retraction of said reset means and thereby reverse resetting movement of said plungers and hammer.

4,594,522

ARMATURE WINDING OF A SPLIT STATOR

Kenzo Fujiwara; Norio Takeuchi; Yoji Nakatsuka; Tsuyoshi Horita; Yuji Nakanishi, and Shigeru Murasato, all of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

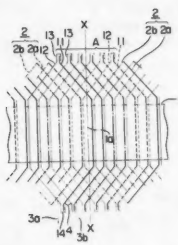
Filed Sep. 20, 1984, Ser. No. 652,609

Claims priority, application Japan, Sep. 26, 1983, 58-150131[U]; Sep. 26, 1983, 58-150132[U]; Sep. 26, 1983, 58-150133[U]; Sep. 26, 1983, 58-150134[U]

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.[4] H02K *15/00*

U.S. Cl. 310—42 **7 Claims**



1. An armature winding of a split stator having a slotted core divided by at least two circumferentially spaced split lines to facilitate the disassembly and assembly of said split stator, said armature winding comprising armature coils in the slots of said core connected to provide poles and arranged to provide a plurality of said armatures coils divided by each of said split lines, each of said divided armature coils having a head at both ends of said stator core crossing from one side of a split line to the other side of the split line, each of said divided armature coils being divided at a split line into part coils having ends, and means including separable conducting fastener means at both ends of said core for connecting the ends of corresponding part coils when the split stator core is assembled and for disconnecting the ends of corresponding part coils to allow the split stator core to be disassembled without removing armature coils from the split stator.

4,594,523

ARMATURE WINDING OF A SPLIT STATOR FOR A ROTARY ELECTRIC MACHINE

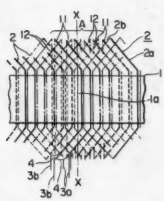
Tsuyoshi Horita; Yoji Nakatsuka; Kenzou Fujiwara; Norio Takeuchi; Yuji Nakanishi, and Shigeru Murasato, all of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1984, Ser. No. 643,185

Claims priority, application Japan, Sep. 17, 1983, 58-171571; Sep. 26, 1983, 58-179641

Int. Cl.[4] H02K *15/00*

U.S. Cl. 310—42 **4 Claims**



1. An armature winding of a split stator having an annular core, slots on the inside surface of said core, and a frame outside of said core, said slotted core being divided by at least two circumferentially-spaced split lines to facilitate the disassembly and assembly of said split stator, said armature winding comprising armature coils in the slots of said core connected to provide poles and arranged to provide a plurality of said armature coils divided by each of said split lines, said divided armature coils being split into half coils, each having a conductor in one of said slots and coil ends at heads of said coils at both ends of said stator core, and means for connecting the coils ends of said half coils so as to allow the stator core to be disassembled without removing armature coils from the slots of the split stator.

4,594,524

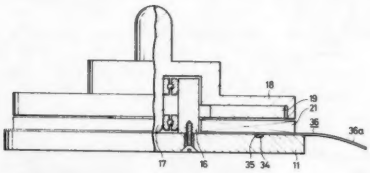
CORELESS-BRUSHLESS MOTOR

Michio Sudo, Kuki, Japan, assignor to Kangyo Denkikiki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,414

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—68 R **25 Claims**



1. A coreless-brushless motor comprising:

a stator yoke;

a driving coil block fixed to said stator yoke, said driving coil block comprising a plurality of sheet coils each having a plurality of spiral coils of a conductor pattern arranged on a circle at equiangular intervals on at least one side of an insulating sheet, said plurality of sheet coils being sequentially laminated together with an insulating layer interposed between each adjacent pair of said sheet coils;

bearing means fixed to said stator yoke;

a rotary shaft rotatably supported by said bearing means;

a rotor yoke affixed to said rotary shaft;

rotor magnet means mounted on said rotor yoke in adjacent and opposing relation to said driving coil block;

a recess formed in a surface of said stator yoke adjacent said driving coil block, the depth of said recess inwards of said surface being less than the thickness of said stator yoke;

a flexible printed circuit sheet comprising a flexible insulating sheet having a plurality of connecting wires of a conductor pattern formed on said flexible insulating sheet, said flexible printed circuit sheet being interposed between said driving coil block and said stator yoke;

a magnetoelectric transducer pellet for detecting the magnetic field of said rotor magnet means, said pellet having a substrate and a magnetoelectric transducer formed thereon, said pellet being located in said recess with said magnetoelectric transducer being disposed on that side of said recess which is adjacent to said driving coil block, the depth of said recess being substantially equal to the thickness of said magnetoelectric transducer pellet; and

a hole, larger in size than said transducer pellet, formed in and extending through said flexible printed circuit sheet in confronting relation to the said recess in the surface of said stator yoke, electrodes of said magnetoelectric transducer being connected via said hole to at least two of said connecting wires in said flexible printed circuit sheet.

4,594,525

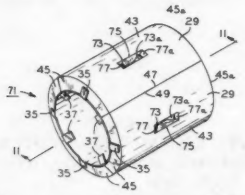
ROTATABLE ASSEMBLY FOR A DYNAMOELECTRIC MACHINE

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 507,878, Jun. 27, 1983, abandoned. This application Jun. 28, 1984, Ser. No. 625,608

Int. Cl.[4] H02K *1/28*

U.S. Cl. 310—156 **27 Claims**



1. A molded rotor assembly comprising:

an annular flux ring defining a medium of distribution for magnetic flux;

a plurality of arcuate permanent magnets circumferentially fastened to the outer surface of said ring and situated adjacent to each other so that the outer surfaces of said magnets generally form the shape of a cylinder, and said magnets being substantially concentrically arranged with respect to the central axis of said ring;

a first plurality of locking tabs circumferentially disposed at one axial end of said ring and a second plurality of locking tabs circumferentially disposed at the opposite axial end thereof, each of said first and second locking tabs extending generally outwardly from said ring and forming an integral part thereof, and said first and second locking tabs being configured to exert generally radially inwardly directed forces upon the opposite axial ends of said magnets so that each of said magnets is mechanically locked to said ring by at least one of said first and second locking tabs, respectively;

an axial shaft extending generally coaxially with the control axis of said ring; and

a molded matrix disposed at least in part between said shaft and said ring.

4,594,526

BIMORPH ELECTROMECHANICAL TRANSDUCER AND CONTROL CIRCUIT DEVICE THEREFOR

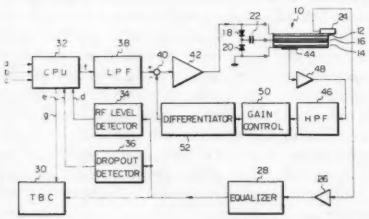
Shigeru Araki, and Hideaki Kato, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Nov. 17, 1983, Ser. No. 552,679

Claims priority, application Japan, Nov. 19, 1982, 57-203169

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—317 **9 Claims**



1. A control device for an electromechanical transducer a free end portion of which displaces in response to a voltage applied across the transducer, said control device comprising:

sensor means for sensing a displacement of the transducer;

driver means for driving the transducer in response to an externally derived drive signal;

feedback means, including a high-pass filter and a differentiator, for applying negative feedback to said driver means in response to an output of the sensor means; and

a low pass filter for cutting off high frequency components of the drive signal, said feedback means and low pass filter coacting to reduce displacment at resonant frequencies of the transducer.

4,594,527

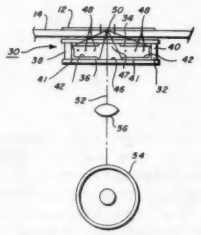
VACUUM FLUORESCENT LAMP HAVING A FLAT GEOMETRY

Frank C. Genovese, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 6, 1983, Ser. No. 539,492

Int. Cl.[4] H01J *1/62*

U.S. Cl. 313—493 **1 Claim**



1. A planar vacuum fluorescent lamp for illuminating a document at an object plane, the top surface of said lamp placed juxtaposed said object plane, said lamp comprising:

a substantially rectangular transparent lamp envelope,

a continuous layer of reflective, conductive material applied to the interior surface of said envelope, said coating being omitted from a first longitudinal strip at the top surface; said first strip defining a document illumination slit, and from a second longitudinal strip at the surface opposite said top surface, said second strip defining an exit window for illumination reflected from the document,

a phosphor layer applied over said reflective conductive material, and

a plurality of axially extending cathode filaments positioned within the lamp,

whereby when said lamp is energized, light reflected from a document in the object plane is directed along an optical path extending through the interior of said lamp exiting the lamp at said exit window.

4,594,528

THIN FILM ELECTROLUMINESCENCE DEVICE AND METHOD OF MANUFACTURING THE SAME

Yoshito Kawakyu, Kawasaki; Toyoki Higuchi, Yokohama, and Hiroshi Ito, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 16, 1983, Ser. No. 532,977

Claims priority, application Japan, Sep. 27, 1982, 57-166567; Mar. 25, 1983, 58-49905

Int. Cl.[4] B05D *3/06*

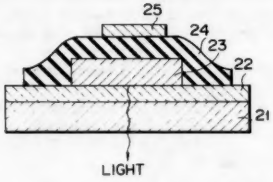
U.S. Cl. 313—503 **9 Claims**

1. An electroluminescence device which comprises a pair of electrodes, at least one of which is transparent, and a light-emitting layer consisting essentially of oxygen-containing amorphous hydrogenated silicon carbide and being interposed between the paired electrodes, wherein the ratio O/(-

Si+C+O) of the amorphous hydrogenated silicon carbide is so determined as to satisfy the formula:

$$0.05 \leqq O/(Si+C+O).$$

6. A method of manufacturing a thin film electroluminescence device, which comprises the step of depositing a light-emitting layer by decomposing a feed gas containing silicon,



carbon, hydrogen and oxygen, by means of glow discharge, thereby producing a light-emitting layer which consists essentially of oxygen-containing amorphous hydrogenated silicon carbide, and wherein the ratio O/(Si+C+O) of the amorphous hydrogenated silicon carbide is so determined as to satisfy the formula:

$$0.05 \leqq O/(Si+C+O).$$

4,594,529

METAL HALIDE DISCHARGE LAMP

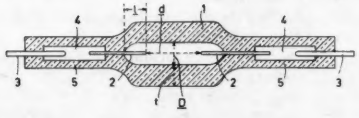
Bertus de Vrijer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 555,920, Nov. 29, 1983, abandoned. This application Sep. 11, 1985, Ser. No. 775,110

Claims priority, application Netherlands, Dec. 1, 1982, 8204653

Int. Cl.⁴ H01J *61/12, 61/04, 61/30*

U.S. Cl. 313—571 **13 Claims**



1. A gas discharge lamp, suitable for use in a reflector as a vehicle headlight lamp, comprising a lamp envelope of quartz glass having an elongate discharge space in which a respective electrode is arranged near each of its ends, current-supply conductors being passed from these electrodes through vacuum-tight seals in the discharge envelope to the exterior, the lamp envelope being filled with an ionizable gas filling, characterized in that the gas filling comprises a rare gas, mercury, and a metal halide, in that the wall thickness t of the lamp envelope is halfway between the electrodes 1.5–2.5 mm, in that the inner diameter D of the lamp envelope halfway between the electrodes is 1–3 mm, the distance d between the tips of the electrodes is 3.5–6 mm, the distance l over which the electrodes each project into the lamp envelope is 0.5–1.5 mm and in that the quantity A, in mg, of mercury in the lamp envelope corresponds to the formula:

$$0.002(d+4\cdot l)D^2 \leqq A \leqq 0.2(d+4\cdot l)D^2$$

in which D, d and l are expressed in mm.

4,594,530

ACCELERATING SELF-FOCUSING CAVITY FOR CHARGED PARTICLES

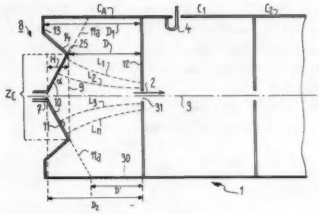
Jeanne Aucouturier, L'Hay Les Roses, and Hubert Leboutet, St. Cloud, both of France, assignors to CGR MeV, Buc, France

Filed May 16, 1984, Ser. No. 610,860

Claims priority, application France, May 20, 1983, 83 08427

Int. Cl.⁴ H01J *25/10*

U.S. Cl. 315—5.41 **4 Claims**



1. In an accelerating self-focusing cavity for charged particles, intended to form the first or only cavity of a linear accelerating structure, comprising a longitudinal axis about which it is defined by a peripheral wall parallel to said longitudinal axis and joining an input wall to an output wall which define said accelerating cavity along said longitudinal axis, said longitudinal axis merging with the axis of a charged particle beam accelerated under the effect of an electromagnetic wave and penetrating into said accelerating cavity through an input orifice formed in said input wall, said output wall being substantially perpendicular to said longitudinal axis and comprising an output orifice through which said beam leaves said accelerating cavity, at least one central zone of said input wall is sloping with respect to said longitudinal axis and moves away therefrom in the direction of propagation of said beam so as to form a surface of revolution admitting said longitudinal axis as axis of revolution and forming through this surface of revolution a lens for focusing the charged particles.

4,594,531

CIRCUIT ARRANGEMENT FOR OPERATING HIGH-PRESSURE GAS DISCHARGE LAMPS

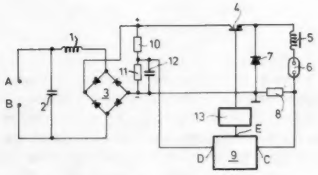
Hans G. Ganser, Stolberg; Ralf Schäfer, Aachen, and Hans P. Stormberg, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 23, 1984, Ser. No. 633,756

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3327030

Int. Cl.⁴ H05B *41/24, 41/14*

U.S. Cl. 315—307 **13 Claims**



6. Apparatus for operating a high pressure discharge lamp comprising: a pair of input terminals for connection to a low frequency source of DC pulsating voltage, means for connecting a switching transistor and a reactance element in series with the discharge lamp across the input terminals, a diode couplable to the lamp to provide a path for lamp current to

flow when the switching transistor is cut-off, and a control device coupled to a control electrode of the switching transistor for operating the switching transistor at a high frequency switching rate, said control device deriving upper and lower reference current levels and an intermediate reference current level between the upper and lower reference current levels, said control device including hysteresis-free comparison means for comparing said reference current levels with the lamp current so as to derive a switching control signal that triggers the switching transistor into cut-off and conduction at lamp current levels equal to the upper and lower reference current levels, respectively, and wherein the control device derives a switching control signal that, after a predetermined number of passages of the lamp current through the intermediate reference current level, triggers a change of state of the switching transistor each time the lamp current subsequently passes through the intermediate reference current level.

4,594,532

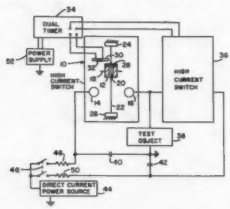
MULTIMEGAVOLT HIGH CURRENT SWITCH

George R. Edlin, Huntsville, Ala., and John D. Robb, St. Paul, Minn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 15, 1984, Ser. No. 621,273

Int. Cl.[4] H01J *1/46, 7/30*

U.S. Cl. 315—331 **6 Claims**



1. A transient switch for initiating high voltage current flow comprising: first and second electrically conductive terminals disposed for having voltage developed thereon, said terminals being positioned a distance apart to prevent arbitrary initiation of current flow therebetween; a conductive member disposed for transient passage directly between said terminals and electrically isolated from external electrical connection; and nonconductive guide means for directing said conductive member through the plane of said terminals along a substantially normal path between the terminals; said conductive member being a cylindrical brass weight having a hole through the center of the cylinder and being movably attached to said guide, and said nonconductive guide being positioned through said hole in the weight.

4,594,533

DEVICE FOR ANALYZING CHEMICAL SUBSTANCE

Martin Snook, Harrow; James M. Rideout, Sanderstead, and Alan Renshaw, Chesham, all of England, assignors to National Research Development Corp., London, England

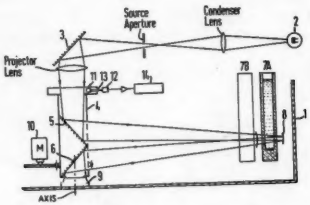
Continuation of Ser. No. 312,167, Oct. 10, 1981, abandoned, which is a continuation of Ser. No. 48,775, Jun. 15, 1979, Pat. No. 4,329,061, which is a continuation of Ser. No. 748,405, Dec. 8, 1976, abandoned, which is a continuation of Ser. No. 567,406, Apr. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 467,796, May 7, 1974, abandoned. This application Nov. 28, 1984, Ser. No. 675,464

Claims priority, application United Kingdom, May 8, 1973, 21935/73; Feb. 4, 1975, 4741/75; Feb. 4, 1975, 4742/75

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—363 **5 Claims**



1. Apparatus for monitoring chemical reactions occurring in a plurality of liquid or the like sample substances carried in a plurality of respective cuvettes whose walls are at least to some extent capable of transmitting radiant energy which comprises:

support means,

a sample loading station having sample loading means mounted on said support means,

a sample unloading station having sample unloading means mounted on said support means,

a sample carrier on said support means for mounting a plurality of samples in radiation-transmissive cuvettes, said cuvettes being disposed serially in a line on said carrier,

photometer means on said support means for producing at least one beam of radiation arranged to intersect said line so as to traverse each cuvette which may move relative to said beam, said photometer means including means to detect the radiation resulting from the said traversal,

means for moving both the carrier and the photometer means to cause said beam consecutively to traverse said cuvettes and any samples which may be contained therein,

the carrier being constructed and arranged continuously to move said cuvettes in a closed, looped path and by stepping action past the sample loading station and the sample unloading station whereat said sample loading and unloading means respectively load and unload samples into and from different cuvettes,

the relative movement being in accordance with a continuous program that for each cuvette of said carrier loads a sample, passes the sample along said path while said photometer means beam intersects and traverses the sample a plurality of times and unloads the said sample, and

means responsive to the traversed, detected radiation to provide a measure of radiation absorbence by each said sample for each traversal thereof by said beam.

4,594,534

HORIZONTAL DEFLECTION CIRCUIT WITH RASTER DISTORTION CORRECTION

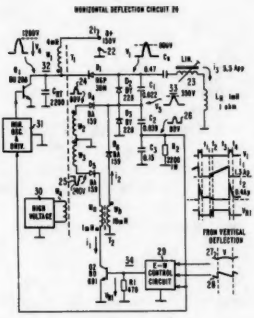
Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 21, 1984, Ser. No. 685,242

Claims priority, application United Kingdom, Apr. 4, 1984, 8408692

Int. Cl.[4] H01J *29/70, 29, 76*

U.S. Cl. 315—408 **10 Claims**



1. A line deflection circuit comprising:

a source of direct current supply voltage;

a flyback transformer including a first winding direct current coupled to said source and a second winding coupled to a load circuit;

a line deflection winding;

a first retrace capacitance coupled to said line deflection winding;

a second retrace capacitance coupled to said first winding;

switching means coupled to said line deflection winding and to said first winding and operable at a line deflection rate for generating a line scanning current in said deflection winding and for applying said direct current supply voltage to said first winding to store energy therein, operation of said switching means defining line trace and retrace intervals such that during said retrace intervals said line deflection winding and said first retrace capacitance form a first resonant circuit to generate a first pulse voltage and said first winding and said second retrace capacitance form a second resonant circuit to generate a second pulse voltage that transfers energy stored in said first winding to said load circuit, said switching means decoupling the two resonant circuits from each other to minimize the interaction therebetween during loading by said load circuit; and

a supply inductance coupled to said flyback transformer and to said deflection winding and having said first pulse voltage developed at a first terminal of said supply inductance and said second pulse voltage developed at a second terminal of said supply inductance for generating a supply current to replenish losses sustained by said deflection winding.

4,594,535

BRUSHLESS, DIRECT CURRENT MOTOR WITH AN ENERGY DISSIPATING CIRCUIT

Seiichi Morikawa, Yachiyo, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,547

Claims priority, application Japan, Feb. 29, 1984, 59-37770

Int. Cl.[4] H02P *6/02*

U.S. Cl. 318—254 **3 Claims**

1. A brushless dc motor driven from a dc power supply having first and second opposite poles, comprising:

(a) a stator having a plurality of field poles;

(b) a plurality of field windings wound one around each field pole of the stator and each having a first extremity adapted to be connected to the first pole of the dc power supply;

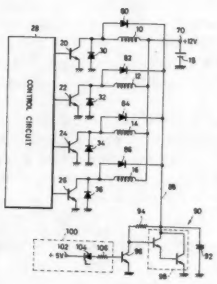
(c) a plurality of switching transistors each to be connected substantially between the second pole of the dc power supply and a second extremity of one field winding, the switching transistors being adapted to be sequentially made conductive to cause the field windings to be sequentially excited from the dc power supply;

(d) a rotor rotatable relative to the stator in response to the sequential excitation of the field windings;

(e) a plurality of protection diodes connected one in parallel with each switching transistor and in a polarity opposite to that of each switching transistor;

(f) a plurality of energy release diodes each having a first end connected to the second extremity of one field winding, in a polarity opposite to that of each protection diode, all the energy release diodes having second ends interconnected; and

(g) an energy dissipating circuit to be connected substantially between the second pole of the dc power supply and



the interconnected second ends of the energy release diodes, the energy dissipating circuit being effective to dissipate the energy induced in the field windings during the nonconducting periods of the switching transistors; said circuit comprising:

a capacitor to be connected substantially between the second pole of the dc power supply and the interconnected second ends of the energy release diodes;

a resistor having a first extremity connected to the interconnected second ends of the energy release diodes;

a first energy dissipating transistor to be connected substantially between the second pole of the dc power supply and a second extremity of the resistor;

a transistor control circuit for causing conduction through the first energy dissipating transistor during the rotation of the motor; and

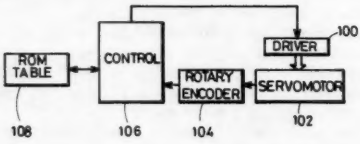
a second energy dissipating transistor to be connected substantially between the second pole of the dc power supply and the interconnected second ends of the energy release diodes, the second energy dissipating transistor being held nonconductive during the rotation of the motor and being rendered conductive when the motor is set out of rotation.

4,594,536

SERVOMOTOR SPEED CONTROL IN A POSITIONING DEVICE

Akira Tamagaki, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 12, 1984, Ser. No. 630,265
Claims priority, application Japan, Jul. 15, 1983, 58-129955
Int. Cl.[4] G05B *13/00*
U.S. Cl. 318—561 8 Claims



1. A positioning device for positioning a servomotor comprising:

current position detection means associated with the servomotor for developing a detection output in response to the rotation of the servomotor;

current distance determination means for determining the current distance from the current motor position to a target point in accordance with said detection output developed from said current position detection means;

a ROM speed table storing a minimum distance to said target for each of a plurality of different speed values;

read out means for reading out said minimum distance from a selected memory area in said ROM speed table corresponding to the current motor speed;

comparing means for comparing said minimum distance read out by said read out means with said current distance determined by said current distance detection means; and

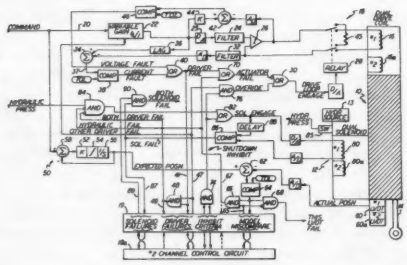
speed control means for reducing the speed of said servomotor when said comparing means determines that said current distance is shorter than said minimum distance.

4,594,537

REDUNDANT CONTROL SYSTEM FOR X-WING VALVE ACTUATORS

Kenneth C. Arifian, Monroe, and Joseph P. Skonieczny, Madison, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1983, Ser. No. 566,004
Int. Cl.[4] G05B *9/03*
U.S. Cl. 318—564 1 Claim



1. In a control arrangement including a series of dual channel electrohydraulic actuators interconnected by averaging linkages so that when a particular actuator is "off" it passively tracks the average position of the two adjacent actuators; in each channel of each actuator, a control circuit comprising,

means (20) for providing a command to the actuator indicative of a desired actuator position;

a solenoid (12) for providing hydraulic pressure to the actuator, thereby turning the actuator "on" in response to a solenoid engage signal;

comparator means (86) for providing a solenoid fail signal in response to the contemporaneous presence of the solenoid engage signal and absence of a corresponding signal indicating coil continuity;

monitor means (38,40,46) for providing a driver fail signal in response to a current or voltage condition indicative of a fault in a drive coil (16) of the actuator;

position means (60) connected to the actuator for providing an actual position signal indicative of the actuator position;

model means (52,54,56,58) for providing an expected position signal indicative of the desired actuator position in response to the command;

comparator means (64) for providing a model miscompare signal in response to a disparity between the actual position signal and the expected position signal;

logic means (66) for providing a hydraulic fail signal in response to the contemporaneous provision of the model miscompare signals from both channels;

logic means (70) for providing an actuator fail signal in response to the driver fail signal, and for providing the actuator fail signal in response to the hydraulic fail signal;

means (74) for providing an inhibit criteria signal in response to extraneous criteria which would make it undesirable to disengage the drive loop;

logic means (76) for providing an override signal in response to the contemporaneous provision of the inhibit criteria signal and the driver fail signal from the other channel;

logic means (30) for providing a drive loop engage signal in response to the nonprovision of the actuator fail signal, and for providing the drive loop signal in response to the override signal;

switch means (28) for disconnecting the drive coil from the control circuit in response to the nonprovision of the drive loop engage signal;

logic means (82,84) for providing the solenoid engage signal in response to the inhibit criteria signal, and for providing the solenoid engage signal in response to the contemporaneous nonprovision of the hydraulic fail signal and the driver fail signals from both channels; and

wherein the actuator is off when the solenoid engage signals from both channels are not provided.

4,594,538

MONITORING CIRCUIT FOR POSITIONING DEVICE

Walter Schmitt, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Continuation of Ser. No. 378,907, May 17, 1982, abandoned. This application Sep. 14, 1984, Ser. No. 650,984
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122621
Int. Cl.[4] G05B *23/02*
U.S. Cl. 318—565 3 Claims

1. In an apparatus for positioning a first component relative to a second component, said apparatus comprising drive means for moving the first component, means for controlling the drive means to move the first component at a desired velocity, and means for measuring the actual position of the first component with respect to the second component and for generating position values representative thereof, the improvement comprising:

means for generating a first signal indicative of the desired velocity;

a capacitor;

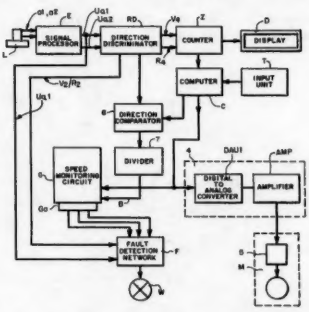
means for charging the capacitor at a rate corresponding to the first signal;

means for periodically discharging the capacitor at a dis-

charge frequency which varies in accordance with the actual velocity of the first component with respect to the second component such that during movement of the first component a sawtooth waveform appears on the capacitor;

first and second comparators, each of which compares the voltage on the capacitor with a respective threshold and generates a respective binary signal indiative of the outcome of the comparison, said thresholds selected such that the sawtooth waveform on the capacitor repetitively crosses both of the thresholds during normal operation of drive means and the controlling means; and

means for checking the states of the binary signals at a plurality of test times and for generating at least one alarm



signal in the event the states of the binary signals deviate from a preselected pattern indicative of normal operation of the drive means and the controlling means, each of said test times being a respective discrete selected instant in time determined as a function of the discharge frequency and occurring at respective intermediate state of charging of the capacitor, said preselected pattern comprising a plurality of subpatterns, each associated with a respective test time, at least two of said subpatterns differing from one another;

said capacitor, charging means, discharging means, comparators and checking means cooperating to monitor discrepancies between the desired and actual velocities and to generate the alarm signal in the event of excessive discrepancies.

4,594,539

LIGHT VALVE

Gunnar P. Michelson, 505 Sea Ranch Dr., Santa Barbara, Calif. 93109

Filed Sep. 6, 1983, Ser. No. 529,945
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—640 **30 Claims**

1. A light valve for varying the size of an opening through which a light beam passes comprising:

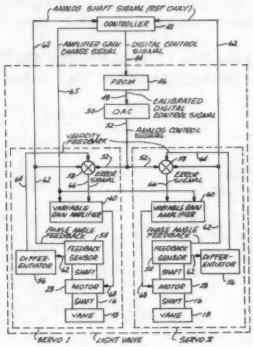
a pair of spaced apart rotatable shafts,

a corresponding vane mounted on each shaft so the vanes extend side by side into the space between the shafts,

means for directing light toward the vanes so that rotation of the shafts causes the vanes to move through an angle toward or away from each other for varying the size of the light beam passing between the vanes,

a separate servo meter coupled to each shaft for rotating the shafts in unison to adjust the amount of light passing between the vanes, and for each servo motor

closed loop servo means responsive to a vane position input signal representing a desired position of each vane for varying the size of the light beam passing between the vanes, and including means for generating a separate position feedback signal as a function of the actual position of the vane on each rotatable shaft throughout operation of the light valve, and means responsive to the vane position input signal and to each position feedback signal for producing separate motor



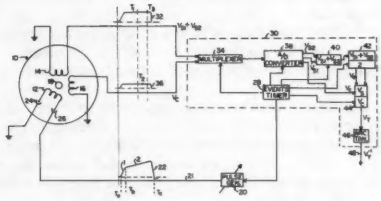
control signals for independently controlling operation of each servo motor to rotate each shaft and vane to constantly pass a selected amount of light between the vanes.

4,594,540

ANGULAR MEASUREMENT SYSTEM

James R. Currie, and Ralph R. Kissel, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 3, 1984, Ser. No. 657,309
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—661 **8 Claims**



1. A shaft angle measurement system comprising:

rotary transformer means having a rotatable winding coupled to a shaft and first and second stationary windings relatively displaced 90°;

exitation means for generating a linear, selectively variable, increasing slope pulse signal, said pulse signal being connected to said rotatable winding;

signal means for sequentially sampling the outputs of said first and second stationary windings and said first and second stationary windings providing discrete signal outputs representative of the sine and cosine of the angle of said shaft; and

computation means responsive to the average of successive outputs of one of said stationary windings and an intermediately, in time, occurring output of the other of said windings for computing the angular position of said shaft.

4,594,541

SWITCHING REGULATOR USING DUAL SLOPE SAWTOOTH GENERATOR

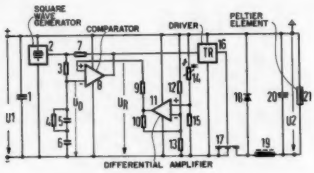
Heinrich Schott, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

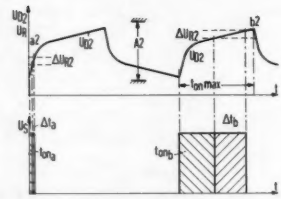
Filed Sep. 11, 1984, Ser. No. 649,319

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333223

Int. Cl.[4] H02M *3/156*

U.S. Cl. 323—288 **7 Claims**





1. A switching regulator comprising:

an input for receiving a voltage to be regulated, and an output;

first voltage means connected to said input for producing a reference voltage;

second voltage means connected to said input for producing a voltage dependent on the value of the voltage to be regulated;

a differential amplifier including a pair of inputs respectively connected to said first and second voltage means;

an electronic switch connected between said input and said output;

a comparison voltage clock generator, including a pulse shaper, operable to emit a clocked comparison voltage having a prescribed non-linear chronological progression for switching on said electronic switch at predetermined turn-on times and decreasing in time intervals following the turn-on times; and

a comparator including an output connected to said electronic switch and a pair of inputs respectively connected to said pulse shaper and said differential amplifier and operable to turn off said electronic switch when the clocked comparison voltage reaches a predetermined value following a turn-on time.

4,594,542

SOLID STATE, HIGH-LOW RESISTANCE MONITOR

Franklin H. Fish, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 21, 1984, Ser. No. 581,835

Int. Cl.[4] G01R *27/02*

U.S. Cl. 324—62 **6 Claims**

1. A resistance monitoring circuit for providing first or second logic level signals as a first output indicative of the presence or absence of at least a predetermined high ohmic condition of the monitored resistance and for providing third or fourth logic level signals as a second output indicative of presence or absence of a predetermined low ohmic condition of the monitored resistance, said circuit comprising:

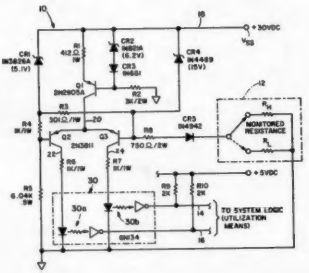
a voltage source;

first voltage divider means connected to said voltage source for providing a first control voltage;

second voltage divider means connected to said voltage source and including said monitored resistance for providing a second control voltage that changes relative to said first control voltage with changes in said monitored resistance;

current regulating means, connected to said voltage source, for providing a source of regulated current;

means defining first and second current paths comprising first and second current to voltage logic level conversion means, respectively; and



first and second solid state switching means, responsive to said first and second control voltages, for directing substantially all said regulated current from said current source through said first current path only when said first control voltage exceeds said second control voltage by a predetermined amount that is small relative to said control voltages and through said second current path only when said second control voltage exceeds said first control voltage by a like predetermined amount, whereby said first conversion means provides as said first output said first logic level signal only when said predetermined high ohmic condition exists and said second logic level signal only when said predetermined high ohmic condition does not exist, and provides as said second output said third logic level signal only when said predetermined low ohmic condition exists and said fourth logic level signal only when said low ohmic condition does not exist.

4,594,543

LIGHTNING WARNING SYSTEM

Andrew J. Eriksson, Midrand, and Patrick C. Kuhn, Pretoria, both of South Africa, assignors to South African Inventions Development Corporation, Pretoria, South Africa

Filed Nov. 7, 1983, Ser. No. 549,599

Claims priority, application South Africa, Nov. 16, 1982, 82/8422

Int. Cl.[4] G01N *31/02*

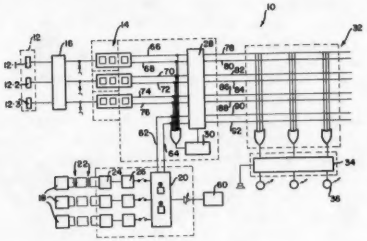
U.S. Cl. 324—72 **9 Claims**

1. An apparatus for warning against lightning strikes, which includes

a plurality of lightning ground flash sensing means each for sensing the occurrence of a ground flash at a distance that is within a predetermined range therefrom, and each for supplying a flash signal if the flash occurred within the predetermined range for that sensing means;

a number of rate determining means each for determining the rate of occurrence of the rate signals of an associated flash sensing means; and

a number of level detecting means, each for detecting if the rate of occurrence as determined by an associated rate determining means exceeds a predetermined value and for providing a level signal if it does, there being twice as many rate determining means and level detecting means as there are flash sensing means, with a pair of rate determining means and level detecting means associated with each



flash sensing means and with one of the level detecting means of each pair for supplying a low level signal if the rate determined by its associated rate determining means exceeds a first low value and the other of each pair for supplying a high level signal if the rate determined by its associated rate determining means exceeds a second, high value.

4,594,544

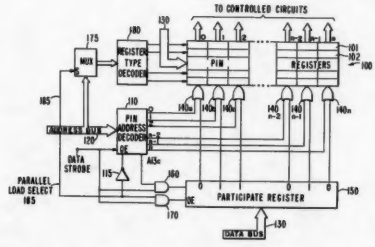
PARTICIPATE REGISTER FOR PARALLEL LOADING PIN-ORIENTED REGISTERS IN TEST EQUIPMENT

R. Warren Necoechea, Milpitas, Calif., assignor to Fairchild Camera and Instrument Corporation, San Jose, Calif.

Filed Mar. 7, 1983, Ser. No. 472,427

Int. Cl.[4] G01R *15/12*; H03K *17/00*

U.S. Cl. 324—73 AT **11 Claims**



1. An automatic test system comprising;

a data bus for transmitting data;

an address bus for transmitting addresses;

a set of pin registers, each register having a unique address and having enabling means connected to receive a signal to enable that register to receive data from the data bus;

a participate register having an enabling terminal, having input terminals coupled to the data bus, and having output terminals coupled to the enabling means of the pin registers for enabling a first plurality of the pin registers to receive data in parallel from the data bus; and

address decoder means connected to receive address signals from the address bus, connected to each enabling means of each of the pin registers, and connected to the enabling terminal of the participate register for enabling one of the participate register or the pin registers to receive data from the data bus, the data for the participate register comprising the addresses of each of the first plurality of pin registers to receive data in parallel from the data bus.

4,594,545

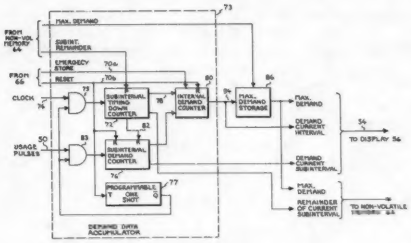
OPERATION OF ELECTRONIC DEMAND REGISTER FOLLOWING A POWER OUTAGE

Warren R. Germer, Dover, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Apr. 12, 1984, Ser. No. 599,743

Int. Cl.[4] G01R *11/64*

U.S. Cl. 324—103 R **7 Claims**



1. Apparatus for controlling demand metering in an electronic demand register of the type including non-volatile memory and a digital processor including a volatile memory, said electronic demand register being effective to accumulate a demand in each of successive time periods and to store a maximum demand of the demands occurring in one of the successive time periods, comprising:

means responsive to an impending power outage for storing at least said maximum demand and a remainder of a time period which is interrupted by said impending power outage;

means responsive to a resumption of power for returning said maximum demand and said remainder of a time period to said volatile memory; and

means for accumulating a demand, starting at zero demand, for an initial time period substantially equal to said remainder of a time period before resuming accumulation of a demand in full successive time periods.

4,594,546

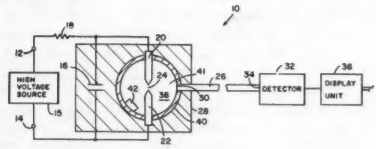
VOLTMETER FOR REMOTELY SENSING HIGH VOLTAGES

Hugh W. Greene, Somerville; James D. Holder, and Thomas G. Roberts, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 12, 1984, Ser. No. 588,488

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—122 **4 Claims**



1. A passive voltmeter for sensing high voltages over ten KV comprising; a housing having a cavity therein; first and second electrical leads adapted for connection to a source of high voltage, a condenser and a resistor connected in series across said first and second electrical leads and having a junction therebetween, first and second electrodes disposed in said cavity in spaced relation to form a spark gap therebetween, said first electrode being connected to said junction intermediate said resistor and said condenser, said second electrode being connected to said second electrical lead; fiber optic light

pipe having first and second ends with said first end located inside said cavity for detecting the rate of light pulses caused by the electrodes and transferring this rate to said second end, a detector connected to said second end for converting said rate to a voltage proportional to said high voltage, and a display unit connected to said detector.

4,594,547

MARK-SPACE AMPLITUDE MODULATOR FOR MEASURING REACTIVE POWER CONSUMPTION OR REACTIVE ENERGY CONSUMPTION

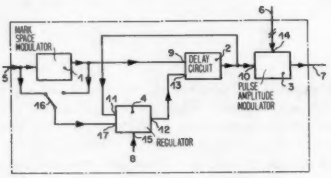
Mathis Halder, Baar, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Nov. 23, 1983, Ser. No. 554,599

Claims priority, application Switzerland, Nov. 30, 1982, 6962/82

Int. Cl.[4] G01R *21/06, 21/133*

U.S. Cl. 324—141 **6 Claims**



1. An apparatus for determining the reactive energy consumption of a circuit

comprising in combination:

a mark-space modulator having an input terminal normally accepting a first signal input, and an output terminal;

pulse amplitude modulating means including one bipolar modulating terminal normally accepting a second and bipolar signal input, a signal output terminal, and a pulse input terminal;

a delay circuit including a data input terminal connected to the output terminal of said mark-space modulator, an output terminal connected to the pulse input terminal of said pulse amplitude modulating means, and a clock input terminal,

a phase angle normally occurring between the input terminal and the output terminal of said delay circuit; and

regulating means interconnected between said mark-space modulator and said delay circuit so as to maintain said phase angle as closely as possible to 90 degrees, even when said first signal input is subject to level variations and to interference,

and wherein said regulating means has an output terminal connected to said clock input terminal of said delay circuit, a clock input terminal for receiving a clock signal, a first signal input terminal connected to the output terminal of said delay circuits, and a second signal input terminal connected to said output terminal of said mark-space modulator,

and wherein said regulating means further comprises:

a time-voltage converter having a clock input terminal, a signal input terminal constituting said second input signal terminal of said regulating means, and a bus output terminal;

exclusive or-gate means having a common unipolar input terminal, a bus input terminal, and comprising exclusive or-gates, each exclusive or gate having a first input connected to said common unipolar input terminal, and a second input, said second inputs constituting said bus input terminal, and an output, said outputs constituting a bus output terminal of said exclusive or gate means;

an accumulator having a clock input terminal, a bus input terminal and a bus output terminal; and

a rate multiplier having a clock input terminal, a bus input terminal, and an output terminal;

said first signal input terminal of said regulating means being connected to said common unipolar input terminal of said exclusive or-gate means, said second input terminal of said regulating means being connected to said signal input terminal of said time-voltage converter, said clock input terminal of said regulating means being connected to said clock input terminal of said accumulator, to said clock input terminal of said time-voltage converter, and to the clock input terminal of said rate multiplier,

said output terminal of said rate multiplier being connected to said output terminal of said regulating means;

a bus connection being established between

said bus output terminal of said time voltage converter and said bus input terminal of said exclusive or-gate means;

said bus output terminal of said exclusive or-gate means and said bus input terminal of said accumulator; and

said bus output terminal of said accumulator and said bus input terminal of said rate multiplier.

4,594,548

MULTI PHASE MAGNETIC SENSOR APPARATUS FOR DETECTING THE POSITION OF MOVING MEMBER

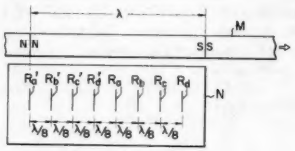
Tadashi Takahashi; Kunio Miyashita; Syooichi Kawamata, and Shigeki Morinaga, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

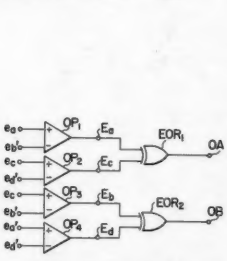
Filed Oct. 31, 1983, Ser. No. 547,259

Claims priority, application Japan, Oct. 29, 1982, 57-189265

Int. Cl.[4] G01B *7/14;* **G01R** *33/02*

U.S. Cl. 324—208 **7 Claims**





1. A muti-phase magnetic sensor apparatus for detecting the position of a moving member comprising: a moving member having a magnetic substance with magnetical signals recorded thereon; a stationary magnetic sensor confronting said moving member and having a plurality of magnetoresistive elements disposed in said magnetic sensor, said magnetoresistive elements having a phase difference of π/m in output electrical angle, where m is an even number larger than or equal to four; first combining means for combining electrical outputs of said magnetoresistive elements, the electrical angles of said electrical outputs differing from each other by a phase difference of π/m, and for outputting the combined electrical outputs; and second combining means for combining said combined electrical outputs from said first combining means, electrical angles of said combined electrical outputs sequentially differing from each other by a phase difference of $2\pi/m$, so that two positional signals of said moving member are obtained, the posi-

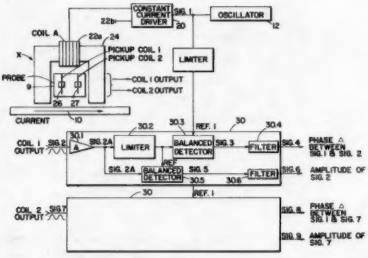
tional signals differing from each other by a phase difference of $\pi/2$.

4,594,549

UNIFORM FIELD GENERATING EDDY CURRENT TESTING PROCESSING METHOD AND APPARATUS

Eugene Smith, Palm Beach Gardens, and Thomas Posluszny, Juno Isles, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 11, 1984, Ser. No. 609,906
Int. Cl.[4] G01N *27/90*; G01R *33/12*
U.S. Cl. 324—232 **3 Claims**



1. Apparatus for providing indicia of the surface region characteristics of an electrically conductive article, comprising:

two electromagnetic field generating heads in close proximity for creating an area of uniform field in the article under test;

oscillator means for providing a constant current alternating drive signal to the heads for energization thereof;

said apparatus characterized by:

probe means positioned between said heads within the uniform field for providing for each of three orthogonal directions, two probe output signals from the field produced by eddy current in the article exposed to the uniform field, each of said probe output signals manifesting the field strength of the eddy current-produced field in two orthogonal directions at one of two adjacent positions in the third direction;

first detection means for providing a first signal that represents the magnitude of the phase difference between each prove output signal and the drive signal;

second detection means for providing a second signal that manifests a characteristic of the magnitude of each output signal:

said probe means comprising a field pickup coil for providing each probe output signal.

4,594,550

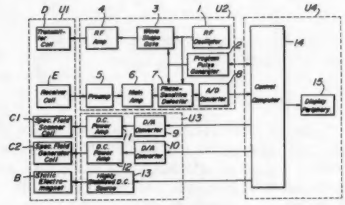
METHOD OF SCANNING SPECIFYING MAGNETIC FIELD FOR NUCLEAR MAGNETIC RESONANCE IMAGING

Yoshifumi Yamada, Utsunomiya; Kunio Tanaka, Asahikawa, and Zenwemon Abe, Yokohama, all of Japan, assignors to Utsunomiya University, Utsunomiya, Japan

Filed Sep. 1, 1983, Ser. No. 528,648
Claims priority, application Japan, Sep. 7, 1982, 57-154491; Sep. 16, 1982, 57-159438
Int. Cl.[4] G01R *33/22*
U.S. Cl. 324—307 **27 Claims**

1. A method of scanning a specifying magnetic field for nuclear magnetic resonance (NMR) imaging of internal information associated with a target placed in a homogeneous static magnetic field H_o by detecting NMR signals generated in said target in response to application of a high-frequency magnetic field thereto which has a Larmor frequency corresponding to an intensity of said static magnetic field, said method comprising the steps of:

generating a specifying magnetic field ΔH_s by synthesizing said static magnetic field H_o with a magnetic field produced by a group of magnetomotive generating means; and



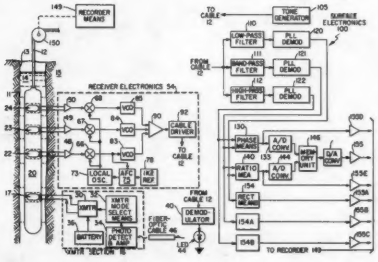
moving spatially a center of said specifying magnetic field ΔH_s by superposing a scanning magnetic field produced by a scanner coil onto a specific direction component of said magnetic field produced by said group of magnetomotive generating means, said specific direction component dominating an intensity variation of said specifying magnetic field ΔH_s.

4,594,551

METHOD OF DEEP PENETRATION WELL LOGGING USING THREE RECEIVERS

Percy T. Cox; Wayne F. Warren, and Theodore W. Nussbaum, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 31, 1983, Ser. No. 480,641
Int. Cl.[4] G01V *3/10, 3/18*
U.S. Cl. 324—341 **5 Claims**



1. A well logging method for determining the dielectric constant and/or conductivity of earth formations, some of which has fluid invasion, in the vicinity of a well borehole comprising the steps of:

transmitting electromagnetic energy into the earth formation from a first location in a borehole at a frequency which enables the electromagnetic energy to propagate throughout the surrounding earth formations,

receiving electromagnetic energy at second, third and fourth locations in a borehole, where said second location is a predetermined distance from said first location, said third location is at a greater predetermined distance from said first location than said second location and said fourth location is at a greater predetermined distance from said first location than said third location,

providing signals representative of the received electromagnetic energy at those locations, and

determining the dielectric constant and/or resistivity of said earth formations in accordance with the signals provided by the receiving step said determining step includes:

deriving an amplitude ratio from the signals representative of the received electromagnetic energies at the second and third locations, and

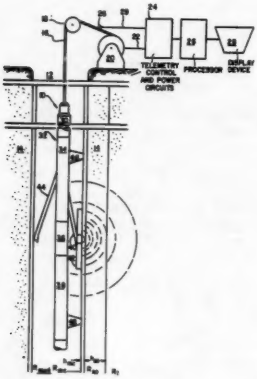
deriving the phase difference between signals representative of the received electromagnetic energies at the third and fourth locations.

4,594,552

LOGGING METHOD AND APPARATUS FOR MEASURING EARTH FORMATION RESISTIVITY AS WELL AS ARM MECHANISM FOR THE SAME

Pierre Grimaldi, Villecresnes, and Jean C. Trouiller, St Remy, both of France, assignors to Schlumberger Technology Corporation, Tex.

Filed Jul. 6, 1983, Ser. No. 511,413
Int. Cl.[4] G01V *3/02, 3/06, 3/18*
U.S. Cl. 324—375 **21 Claims**



1. An apparatus for providing signals indicative of the electrical resistivity of a subsurface formation traversed by a borehole, comprising:

an elongate sonde body, said body including a first electrically conductive section, an insulating section, and a second conductive section in endwise connection;

a pad adapted for lateral extension from said body into engagement with the wall of the borehole and having a wall engaging face of conductive material, said conductive face including a plurality of current electrodes disposed at different longitudinal locations along said conductive face and characterized by a decreasing width and an increasing length as their respective distance from the edge of said conductive face nearest said second conductive body section increases;

means for maintaining the edge of said conductive face nearest said second conductive body section in a plane transversely intersecting said sonde body proximate to the juncture of said first conductive body section and said insulating body section;

means for maintaining said conductive face and said first conductive body section at substantially equal electrical potential; and

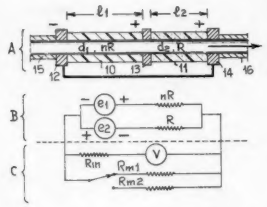
means for maintaining said second conductive body section at a different potential for returning current emitted from said first conductive body section and said conductive face.

4,594,553

WATER PURITY MEASUREMENT

Istvan K. Varga, Windsor Gardens, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU81/00127, § 371 Date May 10, 1982, § 102(e) Date May 10, 1982, PCT Pub. No. WO82/01071, PCT Pub. Date Apr. 1, 1982
Continuation of Ser. No. 380,674, May 10, 1982, abandoned.
This PCT application Sep. 4, 1981, Ser. No. 719,047
Claims priority, application Australia, Sep. 12, 1980, PE5552
Int. Cl.[4] G01N *27/60*
U.S. Cl. 324—454 **9 Claims**



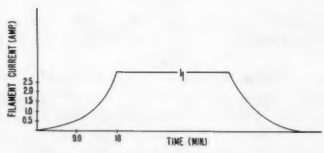
1. A device for measuring the purity of water which comprises a cell having at least a pipe in it arranged for water to be measured to flow therethrough, said pipe being formed of electrically insulating material and formed in two sections confined between a pair of spaced outer electrodes held together by a conductive sleeve engaging the said electrodes, said electrodes each having a socket to receive one end of a divided pipe line and each electrode having means to engage and hold the pipe line ends, further comprising a center electrode disposed between the two sections and insulated from the said sleeve and having an external electrical connection to each outer electrode and to a measuring means, which means comprises, a voltmeter and pair of alternately selectable parallel different value resistances of lower resistivity than the said voltmeter connected between said electrodes to measure the tribo-electric electro-motive force generated across the electrically insulating material under two different resistive loadings to calculate a resitivity figure indicating purity of the water.

4,594,554

PROGRAMMED CONTROL OF ELECTRON BEAM POWER

Jerome D. Schick, LaGrangeville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,517
Int. Cl.[4] H01J *19/82;* H05G *1/52*
U.S. Cl. 328—268 **7 Claims**



1. A method for extending lifetime of a tool having a contamination prone electron microbeam filament serving as a cathode in a triode structure, comprising steps of:

(a) establishing electrical continuity between said microbeam filament and a supply of electrical power;

(b) gradually increasing the power supplied to the microbeam filament over a predetermined time interval measured in excess of minutes from zero power level to a

microbeam filament saturation power level at which the microbeam filament no longer continues to demonstrate an increase in beam intensity for increases in beam power while thermal equilibrium of said filament is achieved such that a contamination free electron beam source is maintained;

(c) maintaining power to said microbeam filament at substantially the saturation level during use of the tool to maintain thermal equilibrium of said filament, and

(d) gradually decreasing the power supplied to the microbeam filament over a predetermined time interval also measured in excess of minutes from substantially the saturation power level to a zero power level when the microbeam filament is turned off while maintaining thermal equilibrium of said filament.

4,594,555

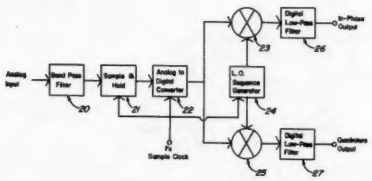
FREQUENCY SELECTIVE SAMPLING DETECTOR

Howard E. Hilton, Snohomish, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 29, 1984, Ser. No. 665,694

Int. Cl.[4] H03D *5/00*

U.S. Cl. 329—135 **4 Claims**



1. A detector for detecting amplitude and phase of modulation on a carrier signal, said detector comprising a bandpass filter, for filtering the carrier signal received therefrom to a first selectable bandwidth at a first selectable center frequency:

sample and hold means, coupled to the bandpass filter, for sampling the carrier signal received therefrom at a selectable rate;

converter means, coupled to the sample and hold means, for converting the carrier signal received therefrom to digital data;

first multiplier means, coupled to the converter means, for multiplying the digital data received therefrom by a first selectable signal to produce an in-phase component of the modulation of the carrier signal;

second multiplier means, coupled to the converter means, for multiplying the digital data received therefrom by a second selectable signal to produce the quadrature component of the modulation of the carrier signal; and

first and second filter means coupled to the first and second multiplier means, respectively, for filtering undesired components of the modulation signals received therefrom.

4,594,556

DEMODULATION CIRCUIT FROM FM SIGNALS AND DEMODULATION SYSTEM THEREFOR

Tomozo Ohta, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 18, 1984, Ser. No. 632,105

Claims priority, application Japan, Jul. 22, 1983, 58-134982; Jul. 22, 1983, 58-134983

Int. Cl.[4] H03D *3/00*

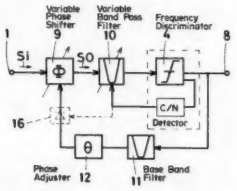
U.S. Cl. 329—137 **8 Claims**

1. A demodulation circuit for frequency modulated (FM) signals comprising:

phase shifter means for receiving inputted FM signals and shifting the phase of said FM signals in response to phase adjust control signals;

first filter means for receiving FM signals output from said phase shifter means and passing random band FM signals continually compressed to a band width narrower than the width of the curson band for FM signals;

frequency discriminator means for detecting said random band FM signals, outputting the same and feeding back a selected portion thereof;



second filter means for passing specific frequency components of said selected portion; and

phase adjuster means for adjusting the phase of said specific frequency components to generate phase adjust control signals, and applying said control signals to said phase shifter means to enable said phase shifter means to vary the phase of the FM signals in the direction of compression of said random band width.

4,594,557

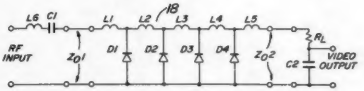
TRAVELING WAVE VIDEO DETECTOR

Robert W. Shillady, North Wales, Pa., assignor to American Electronic Laboratories, Inc., Lansdale, Pa.

Filed Jul. 11, 1985, Ser. No. 754,059

Int. Cl.[4] H03D *1/10*

U.S. Cl. 329—160 **16 Claims**



1. Traveling wave video detector, comprising:

an artificial transmission line formed by a planar array of elements including plural spaced diodes,

a first transmission line connected to one of said diodes at the input side of said artificial transmission line,

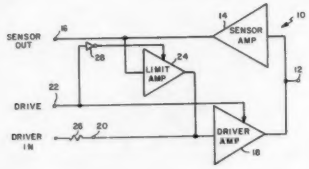
a terminating resistor and a second transmission line connected between another of said diodes which is at the output side of said artificial transmission line and the terminating resistor, the impedance of said terminating resistor being substantially equal to the characteristic impedance of the artificial transmission line,

said diodes being interconnected in shunt by wires arranged in successive arcs in a plane, each wire having a length and diameter so as to form an inductance between adjacent diodes, each inductance being substantially equal to $C \times Z_0^2$ where C is the parasitic junction capacitance of a diode and Z_0 is the value of the characteristic impedance of the artificial transmission line.

4,594,558
HIGH-SWITCHING-SPEED D.C. AMPLIFIER WITH INPUT-OFFSET CURRENT COMPENSATION

James S. Congdon, Sudbury, Mass., assignor to Genrad, Inc., Concord, Mass.

Filed Apr. 12, 1985, Ser. No. 722,598
Int. Cl.[4] H03F 1/14, 3/26
U.S. Cl. 330—9 11 Claims



1. For selectively driving an object node, an amplifier circuit comprising:

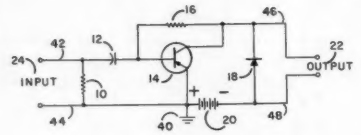
A. a disconnectable unity-gain driver amplifier having an input node and being operable by application of switching signals thereto to change between driver-high-impedance and driver-low-impedance states, the driver amplifier being connected for driving of the object node with an amplified replica of the signal at its input node when it is in its driver-low-impedance state and for presentation of a high impedance to the object node when it is in its driver-high-impedance state; and

B. a limiting amplifier for producing as its limiting-amplifier amplifier output a unit-voltage-gain amplified replica of the signal on the object node and applying the limiting amplifier output to the input node of the driver amplifier when the driver amplifier is in the driver-high-impedance state so as to limit the potential difference across the driver amplifier when it in its driver-high-impedance state.

4,594,559
METAL DETECTOR AUDIO AMPLIFIER

David S. Bernzweig, 24 Raleigh Rd., Framingham, Mass. 01701

Filed Sep. 12, 1983, Ser. No. 531,295
Int. Cl.[4] H03F 1/26; G01V 3/11
U.S. Cl. 330—149 2 Claims



1. An accessory device for use with a metal detector of the type using earphones, said device being connected to the audio output of said metal detector comprising:

means to amplify low audio signals from said audio output to easily audible levels;

means to dampen loud signals causing those signals to be softer, said device including:

a casing;

means to releasably attach said casing to said metal detector;

a first cable means to attach to said audio output and carry said signal to said casing;

an electronic circuit within said casing including:

an input having a first input line and second input line extending therefrom, said input lines being interconnected by said first cable means to said audio output;

a transistor having a base, emitter and collector;

said first input line extending to the base of said transistor;

said second input line extending to the emitter of said transistor;

a capacitor on said first input line between said input and the base of said transistor;

a first resistor, one end of which is attached to said first input line between said capacitor and said input and the second end of which is attached to said second input line between said transistor's emitter and said input;

a feedback loop with a second resistor thereon extending from said transistor's collector and said first input line between said capacitor and the base of said transistor;

a power source such as a 1.5 volt battery on said second input line;

a ground between said power source and said first resistor on said second input line;

a line interconnecting said transistor's emitter to said ground;

a first output line extending from said transistor's collector;

a second output line extending from said power source;

said means for dampening loud signals including:

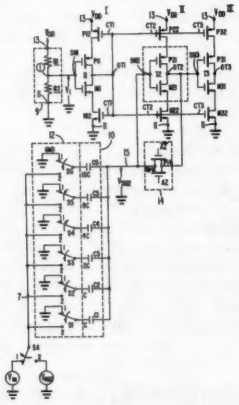
a diode having its first end connected to said first output line and its second end connected to said second output line; and

a second cable means attaching said first and second output lines to said earphones.

4,594,560
PRECISION SETTING OF THE BIAS POINT OF AN AMPLIFYING MEANS

Andrew G. F. Dingwall, Bridgewater Township, Somerset County, and Victor Zazzu, Montvale Boro, Bergen County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 17, 1985, Ser. No. 724,245
Int. Cl.[4] H03F 3/18, 3/16
U.S. Cl. 330—296 13 Claims



6. The combination comprising:

first and second power terminals for the application therebetween of an operating potential;

first and second compound inverter stages, each stage having a like number of insulated-gate field-effect transistors (IGFETs) connected between said first and second power terminals with the characteristics of the IGFETs of one stage being similar to that of the IGFETs in the other stage, whereby the response of one stage is similar to the

response of the other stage for like bias conditions, each compound inverter stage having a control input, a signal input, and a signal output at which is produced a signal which is a function of the signals applied to the control and signal inputs of the compound inverter stage;

means for direct current (d.c.) connecting a selected voltage level to the signal input of said first stage, and means connecting the signal output of the first stage to its control input for producing at said signal output of said first stage an intermediate bias voltage which is a function of the selected voltage level and the characteristics of the IGFETs of the first stage;

means for applying said intermediate bias voltage to the control input of said second stage;

selectively enabled switch means connected between said signal input and said signal output of said second stage for, when enabled, providing a relatively low impedance path between said signal output and said signal input of said second stage and concurrently producing at said signal input and said signal output of said second stage a voltage which is substantially equal to said selected voltage level; and

means for applying an input signal to said signal input of said second stage and means for concurrently disabling said switch means for producing at said signal output of said second stage a signal which is a function of the difference between the selected voltage level and the input signal multiplied by the gain of the second stage.

4,594,561

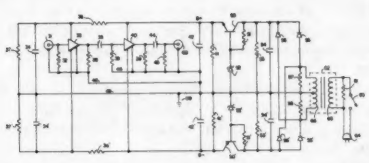
AUDIO AMPLIFIER WITH RESISTIVE DAMPING FOR MINIMIZING TIME DISPLACEMENT DISTORTION

Robert M. Grodinsky, Skokie, and David G. Cornwell, Chicago, both of Ill., assignors to RG Dynamics, Inc., Skokie, Ill.

Filed Oct. 26, 1984, Ser. No. 665,049

Int. Cl.[4] H03F *1/30*

U.S. Cl. 330—297 **8 Claims**



1. An amplifier system comprising:

a DC power supply;

a signal amplifying gain stage coupled to said DC power supply;

means supplying an audio signal that is transient and unsymmetrical in nature to said signal amplifying gain stage for amplification thereby;

a plurality of energy storing filter capacitors in said DC power supply interconnected with said signal amplifying gain stage and interacting therewith and producing undesirable time displacement distortion in said audio signal; and

continuously active energy dissipating damping means comprising resistors connected in parallel with at least some of said filter capacitors.

4,594,562

AMPLIFIER WITH CURRENT-VOLTAGE CONVERSION, PARTICULARLY PREAMPLIFIER OF AN OPTICAL RECEIVER

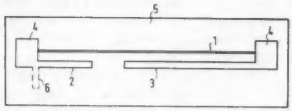
Reinhard Gurke, Windeck-Schladern, and Manfred Eichel, Stuttgart, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 16, 1984, Ser. No. 661,512

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338024

Int. Cl.[4] H03F *1/32*

U.S. Cl. 330—307 **20 Claims**



1. Transimpedance amplifier arrangement using current feedback through a resistor arranged between an output and an input of an amplifier, and serving to convert an input current into an output voltage, characterized in that the feedback resistor is constituted by a resistive strip provided on a substrate and having two spaced ends, that at least one pair of separate conductive strips lying on a straight line extend parallel to the resistive strip on the substate and each has one end close to and another end remote from the refractive other conductive strip of said pair, and that each of the two other ends of said conductive strips of said pair extends, and is connected, to a different one of said two spaced ends of said resistive strip.

4,594,563

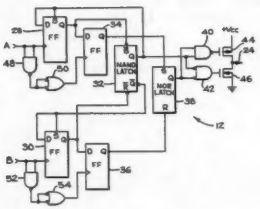
SIGNAL COMPARISON CIRCUIT AND PHASE-LOCKED-LOOP USING SAME

Marshall Williams, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 2, 1984, Ser. No. 667,677

Int. Cl.[4] H03D *13/00*; H03L *7/18*

U.S. Cl. 331—1 A **15 Claims**



7. A phase-locked-loop for producing a periodic output signal having a predetermined frequency determined by the frequency of a reference signal, including:

oscillator means for producing an output signal whose frequency varies in response to a control signal; and

a comparison circuit implementable as a gate array, which circuit is responsive to said output signal and to said reference signal for producing said control signal indicative of the difference between the phase and frequency of said output signal and the phase and frequency of said reference signal, said array comprising:

master indication means for indicating which of said reference signal and said output signal last passed through a predetermined angular position;

means for delaying said output signal and said reference signal;

slave indication means, responsive to the indication of said master indication means and to said delayed reference and output signals, for indicating if one of said reference and said output signals twice passed through said predetermined angular position since the other one of said reference and output signals passed through said predetermined angular position; and

output decoding means, responsive to the indications of said master and said slave indication means, for producing a first control signal if said reference signal twice passed through said predetermined angular position since said output signal passed through said predetermined angular position and was also the last one of said reference and output signals to pass through said predetermined angular position, and for producing a second control signal different from said first control signal if said output signal twice passed through said predetermined angular position since said reference signal passed through said predetermined angular position and was also the last one of said reference and output signals to pass through said predetermined angular position.

13. A comparison circuit implementable as a gate array for comparing first and second periodic input signals, comprising:

master indication means for indicating which of said first and second periodic input signals last passed through a predetermined angular position;

means for delaying said first and second input signals;

slave indication means responsive to the indication of said master indication means and to the output of said delaying means for indicating if one of said input signals twice passed through said predetermined angular position since the other one of said input signals passed through said predetermined angular position; and

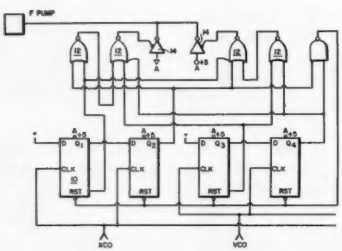
output decoding means responsive to the indications of said master and slave indication means for indicating if one of said input signals twice passed through said predetermined angular position since the other one passed through said predetermined angular position and was also the last one of said input signals to pass through said predetermined angular position.

4,594,564

FREQUENCY DETECTOR FOR USE WITH PHASE LOCKED LOOP

John M. Yarborough, Jr., Palo Alto, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jun. 11, 1984, Ser. No. 619,096
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—1 A **9 Claims**



1. A frequency detector for use with a phase locked loop that includes a voltage controlled oscillator (VCO) comprising:

a first input for a first digital signal representing a reference frequency,

a second input for receiving a second digital signal representing the frequency of the VCO of the phase locked loop,

at least one tri-state driver circuit having an output for deriving at least a frequency pump-up or a frequency pump-down signal for the VCO,

first, second and third bistable devices,

means coupling an input of the first bistable device and an input of the second bistable device to said first input,

means coupling an input of the third bistable device to said second input,

means coupling an output of the first bistable device to a second input of the second bistable device, and

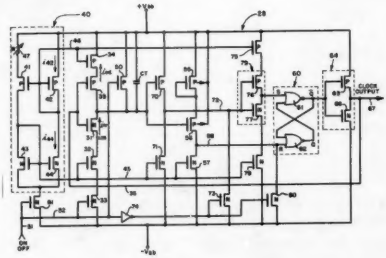
a logic circuit having input means coupled to outputs of the bistable devices and output means coupled to input means of the driver circuit to control the driver circuit to provide a pump-up or pump-down signal as its output determined by the relative frequency difference of first and second digital input signals at said first and second inputs and independently of a phase difference between the input signals.

4,594,565

CLOCK OSCILLATOR FOR A CARDIAC PACER HAVING FREQUENCY COMPENSATION FOR TEMPERATURE AND VOLTAGE FLUCTUATIONS

Francisco J. Barreras, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Aug. 30, 1984, Ser. No. 646,222
Int. Cl.[4] H03K *3/57*; H03L *1/02*
U.S. Cl. 331—108 A **13 Claims**



1. A clock circuit for use in a battery operated cardiac pacer or the like, comprising:

a timing capacitor;

charage circuit means operable in response to an applied bistable logic control signal for applying a charge current to said timing capacitor when said control signal is of one logic state;

discharge circuit means operable in response to said applied logic control signal for applying a discharge current to said timing capacitor when said control signal is of opposite logic state;

at least one of said circuit means producing a current undesirably varying as a function of ambient temperature;

first threshold means responsive to the voltage level across said timing capacitor for setting said logic control signal to said one logic state to inhibit said discharge circuit means and actuate said charge circuit means upon said capacitor voltage reaching a first threshold voltage;

second threshold means responsive to the voltage level across said timing capacitor for setting said logic control signal to said opposite logic state to inhibit said charge circuit means and actuate said discharge circuit means upon said capacitor voltage reaching a second threshold voltage; and

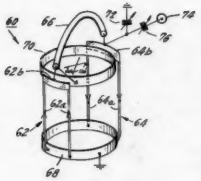
temperature compensating means in circuit relationship with at least one of said threshold means for varying the threshold voltage thereof in response to changes in temperature whereby the frequency remains substantially constant notwithstanding changes in ambient temperature.

4,594,566

HIGH FREQUENCY RF COIL FOR NMR DEVICE

Andrew A. Maudsley, Boston, Mass., assignor to Advanced NMR Systems, Inc., Woburn, Mass.

Filed Aug. 30, 1984, Ser. No. 646,370
Int. Cl.[4] H01P 7/00, 5/12
U.S. Cl. 333—219 21 Claims



1. An rf coil for an NMR device, the coil being tuneable to at least one resonant frequency and comprising:

at least two active sections, the active sections all being substantially parallel to an axis, each active section having a drive end and a ground end that is connected to a common potential, each drive end being situated in a first region and each ground end being situated in a second region, the first and second regions being spaced from each other along the axis, each active section comprising at least one conductive element extending between the drive end and the ground end; and

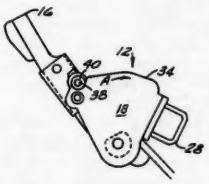
a connecting circuit connected between the drive ends of the active sections, each active section being coupled by the connecting circuit to at least one of the other active sections, the connecting circuit maintaining a phase difference of approximately one-half wavelength between the drive ends of two of the active elements at a, tuned resonant frequency.

4,594,567

CIRCUIT BREAKER CONTACT ARM ASSEMBLY HAVING A MAGNETIC CARRIER

Bernard DiMarco, Lilburn, Ga., and Charles W. Stanford, Bellefontaine, Ohio, assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Sep. 28, 1984, Ser. No. 656,150
Int. Cl.[4] H01H 75/02
U.S. Cl. 335—16 8 Claims



1. A blow open contact arm assembly for a circuit breaker, comprising:

an electrically conductive stationary contact arm having a preselected length with a contact fixed on one end;

an electrically conductive movable contact arm having a preselected length with a contact fixed on one end, said contact arms being positioned in generally parallel relation in the closed position where a current flow from one contact arm through contacts through the other contact arm creates opposing magnetic fields which force the arms to move apart in response to current flow of a preselected magnitude; and

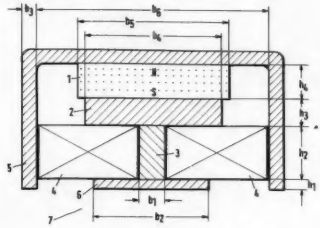
a ferromagnetic carrier attached to the movable contact arm and positioned thereabout for creating a magnetic field about the movable contact arm thereby attracting the arm to an open position.

4,594,568

PERMANENT MAGNETIC CHARGE TAKING OR HOLDING DEVICE

Klaus-Dieter Hübner, Gotenstrasse 152, 5840 Schwerte; Dieter Oettinghaus, Im Kirchenberg 21, 5800 Hagen, and Wolfram Stanek, Bergstrasse 10, 5401 Hungenroth, all of Fed. Rep. of Germany

Filed Jun. 25, 1985, Ser. No. 748,427
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423482
Int. Cl.[4] H01F 7/20
U.S. Cl. 335—289 1 Claim



1. In an electrically controllable permanent magnet load taking or holding device for raising, transporting and stacking ferromagnetic parts comprising a magnetized permanent magnet centrally arranged in the direction of its smallest dimension in a magnetically conducting iron support member, a magnetically conducting compensation plate having a magnetically conducting bar and a magnetically conducting pole on said magnet, and an electrical coil between the compensation plate for compensation of the magnetic field in the area of the working air gap the improvement comprising maintaining the following relationship of the structural dimensions.

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(1) $\frac{b_5}{b_6} = \frac{0.5 \text{ to } 0.75}{1}$

(2) $\frac{b_4}{b_5} = \frac{0.8 \text{ to } 1.0}{1}$

(3a) $\frac{b_1}{b_1} = \frac{0.15 \text{ to } 0.2}{1}$ for ferritic permanent magnets

(3b) $\frac{b_1}{b_5} = \frac{0.4}{1}$ for permanent magnets of rare earth - cobalt alloys

(4) $\frac{b_2}{h_3} = \frac{0.9 \text{ to } 1.1}{1}$

(5) $\frac{b_3}{b_2} = \frac{0.1 \text{ to } 0.15}{1}$

(6) $\frac{b_3}{b_2} = \frac{0.1 \text{ to } 0.15}{1}$

(7a) $\frac{h_4}{b_5} = \frac{0.15 \text{ to } 0.1}{1}$ for ferritic permanent magnets

(7b) $\frac{h_4}{b_5} = \frac{0.05 \text{ to } 0.1}{1}$ for permanent magnets of rare earth - cobalt alloys

(8) $\frac{h_2}{b_5} = \frac{0.3 \text{ to } 0.4}{1}$

-continued

(9) $\frac{h_1}{b_1} = \frac{0.25 \text{ to } 0.4}{1}$

where b is the width of the conducting bar,
b_2 is the width of the conducting plate,
b_3 is the distance between the inner and outer surface of the iron support member,
b_4 is the width of the conducting plate,
b_5 is the width of the permanent magnet,
b_6 is the distance between the opposite inner surfaces of the iron support member,
h_1 is the height of the iron support member from its outer edge to the electrical compensation coil,
h_2 is the height of the electrical compensation coil,
h_3 is the height of the conducting bar, and
h_4 is the height of the permanent magnet.

4,594,569

HUMIDITY SENSITIVE DEVICE

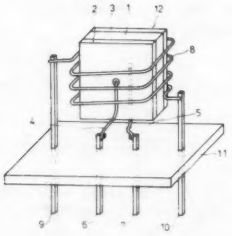
Fumio Fukushima, Miyazaki; Jiro Terada, and Tsuneharu Nitta, both of Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 682,827, Dec. 19, 1984, which is a continuation of Ser. No. 462,974, Feb. 1, 1983, abandoned. This application Nov. 12, 1985, Ser. No. 796,506

Claims priority, application Japan, Feb. 12, 1982, 57-21433; Mar. 12, 1982, 57-39826

Int. Cl.[4] H01L *7/00*

U.S. Cl. 338—35 **9 Claims**



1. A humidity sensitive device for sensing the humidity of an ambient atmosphere comprising:
humidity sensitive resistor means for exhibiting an electrical resistance which is dependent upon chemisorption of water vapor at a temperature substantially above 200° C. where substantially no physisorption is possible to thereby responsively sense the humidity of an ambient atmosphere during a humidity sensing operation conducted at said temperature;
said humidity sensitive resistor means consisting essentially of at least one main component selected from the group consisting of ZrO_2, Nb_2O_5, and Ta_2O_5; and
electric heater means for maintaining said humidity sensitive resistor means at said temperature above 200° C. during said humidity sensing operation.

4,594,570

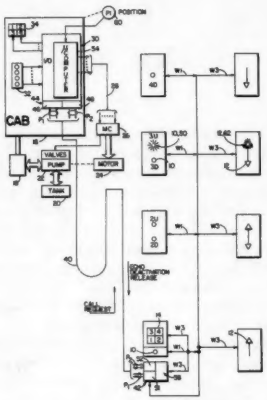
ELEVATOR CONTROL

George C. Tweed, Jr., and Richard C. McCarthy, both of Simsbury, Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 17, 1982, Ser. No. 442,391

Int. Cl.[4] B66B *3/02*

U.S. Cl. 340—21 **11 Claims**



1. An elevator for servicing a plurality of floors in a building:
a car;
a car drive for propelling the car;
a controller for controlling the operation of the car;
a hall call button on a floor for requesting service to the controller;
a hall button light associated with the button for indicating a hall call request;
a hall lantern on the floor for indicating the assignment of the car to the registered call, characterized by;
a stationary transceiver comprising:
means for providing a first signal that comprises two signals in response to the operation of said button, said first signal identifying the service request and the button;
means for activating the light in response to a second signal comprising said two signals and deactivating said light in response to said second signal and a third signal;
means for activating said lantern in response to a fourth signal comprising two tones identifying the lantern;
a mobile transceiver, on the car, comprising:
means for registering a service request in response to said first signal;
means for providing said second signal after the request is registered;
means for providing said second signal and said third signal when the request is answered;
means for providing said fourth signal when the request is answered;
a first pair of wires connecting said transceivers for carrying said first signal; and
a second pair of wires connecting said transceivers for carrying said second, third and fourth signals.

4,594,571
MULTIPLEX CABLING SYSTEM FOR VEHICLES

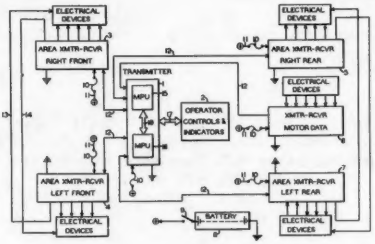
Detlev Neuhaus, Langenhagen; Karl-Heinz Hesse, Gehrden; Gerhard Ruhnau, Neustadt, and Peter Liermann, Barsinghausen, all of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,532

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149142

Int. Cl.⁴ B60Q *1/00*

U.S. Cl. 340—52 F **5 Claims**



1. A multiplex cabling system for a motor vehicle having a plurality of electrical devices located at selected locations which may be controlled by an operator, comprising,

(a) a central transmitter means operable for encoding and transmitting selective command messages and receiving and decoding selective indication messages,

(b) an operator's panel coupled to said central transmitter means for supplying selective device commands and registering received indications,

(c) a plurality of transmitter-receivers, one at each of the selected locations on said vehicle and coupled to said central transmitter means by a star-arranged communication network, each transmitter-receiver operable for receiving and decoding selective command messages and transmitting distinctive indication messages,

(d) a selected number of said controlled devices within an area at each selected location coupled to the corresponding transmitter-receiver to be selectively controlled in accordance with the commands initiated by the vehicle operator, and

(e) said devices also controlling said corresponding transmitter-receiver for transmitting status indications for registry on said panel, and in which said plurality of transmitter-receivers at least includes a separate transmitter-receiver positioned in the vicinity of each corner of said vehicle coupled to said controlled devices at that location, another transmitter-receiver associated with vehicle propulsion means for transmitting operating and condition indications to said central transmitter means,

and which further includes, cross-connections from selected devices at one location to the transmitter-receiver at a second location for enabling continued control during a fault condition in the transmitter-receiver normally associated with said selected devices.

4,594,572
OPTICAL MULTIPLE OUTPUT DISPLAY SYSTEM, PARTICULARLY FOR AUTOMOTIVE DASHBOARDS

Georg Haubner, Berg; Hartmut Zöbt, Fürth, and Hans Petermann, Nuremberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 30, 1982, Ser. No. 445,427

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149291

Int. Cl.⁴ G08B *19/00*; H04Q *9/00*

U.S. Cl. 340—52 F **14 Claims**

1. A low-interference multiple output optical display system with reduced cabling requirements, and thereby reduced exposure to electrical noise and crosstalk, to display values relating to the operation of a dynamic apparatus, particularly a motor vehicle, indicating operating parameters and conditions of the vehicle and its components, having

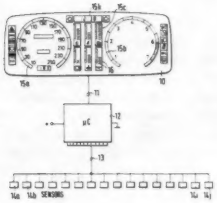
electro-optical indicator blocks (**15*a* . . . 15*k***) arranged in fixed positions on a panel (**10**) to display said values;

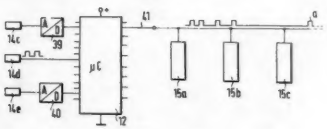
a plurality of sensors (**14*a* . . . 14*j***) providing sensor output signals representative of different respective operating, operation, and condition parameters;

a logic circuit (**12**) located remotely from said indicator blocks but in close proximity to said sensors, connected to and receiving said sensor output signals and providing signals for the indicators in dependence on the values of said sensor output signals,

wherein

each indicator block (**15*a* . . . 15*k***) includes a plurality of indicator elements (**16, 53**) which are controllable by





binary signals, the plurality of indicator elements of any one indicator block being combined to provide an output display of a selected operating condition parameters, and a shift register (**17, 18; 50**) in each indicator block and forming a structural unit therewith;

a single control signal conductor (**21, 41**) is provided, connecting the logic circuit (**12**) and at least a plurality of said indicator blocks (**15*a* . . . 15*k***); and

said logic circuit is connected and arranged to provide a serial pulse train (Ta) over said single conductor (**21, 41**), forming an information pulse train being applied to said shift registers, said shift registers decoding the data carried by said pulse train, and hence the information forming the values to be indicated by the indicator elements, the indicator elements (**16, 53**) of the respective indicator blocks (**15*a* . . . 15*k***) being associated with selected stages of the shift registers.

4,594,573
REVERBERATION SOUND GENERATOR

Muneki Yoshino, Aichi, and Toshitaka Tanahashi, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 19, 1983, Ser. No. 459,199

Int. Cl.⁴ B60Q *1/00*

U.S. Cl. 340—62 **5 Claims**

1. A reverberation sound generator comprising:

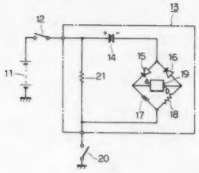
a power supply;

a capacitor connected to said power supply;

a pair of first and second diodes and a pair of first and second resistors which are connected in series to said capacitor,

said diodes being connected in parallel to each other in opposite polarity, said resistors being connected in parallel to each other;

a sound generator circuit having terminals connected between said first diode and resistor and between said second diode and resistor, respectively, said sound generator circuit being energizable to produce a sound responsive to the difference between potentials at said terminals;



a sound generation command switch connected in series with said first and second diodes and resistors, said capacitor being chargeable in response to closing of said sound generation command switch; and

a discharging circuit connected between a junction between said sound generation command switch and said first and second diodes and resistors and another junction between said power supply and said capacitor.

4,594,574

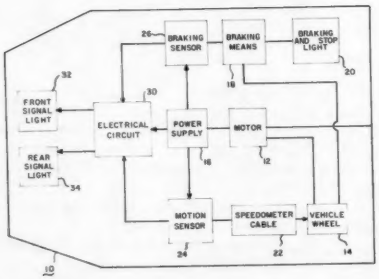
VEHICLE MOTION SIGNALLING SYSTEM

John S. Thurman, Rte. 1, Box 9, Hallsboro, N.C. 28442

Filed Nov. 5, 1984, Ser. No. 668,282

Int. Cl.[4] B60G *1/26*

U.S. Cl. 340—71 **7 Claims**



1. In combination with a vehicle having a moter, a braking means controlled by operator actuation of a brake, a braking and stop combination light, said vehicle also having a plurality of wheels with at least one of said wheels being connected to said braking means and to a speedometer cable and said vehicle also having an electricity generator connected to said motor and powered by said moter, the improvement comprising:

at least a first signal light located at the front of said vehicle and at least a second signal light located at the rear of said vehicle,

an electrical circuit means connected to each said signal light and responsive for actuation of each said signal light,

a motion sensor means, connected to at least one of said wheels via said speedometer cable and to said electrical circuit means, for sensing when said wheel is moving and simultaneously providing a first electrical signal output to said electrical circuit means,

a braking sensor means for sensing actuation of said braking means and providing a second electrical signal output to said circuit means,

said circuit means further comprising means for simultaneously directing electrical power to each of said signal lights upon actuation by a combination of the electrical signal output from said motion sensor means and the electrical signal output from said braking sensor means,

said means for directing electrical power to each of said signal lights comprising a first power relay adapted to receive said electrical signal output from said motion sensor means, said first power relay being interconnected between said signal lights and said motion sensor means, said first power relay being actuated by an electrical signal from a second power relay, said second power relay being interconnected between said first power relay and said braking sensor means, said second power relay having an independent power supply comprising said electricity generator.

4,594,575

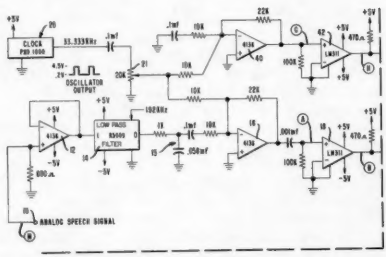
DIGITAL PROCESSOR FOR SPEECH SIGNALS

James M. Avery, Austin, Tex., and Elmer A. Hoyer, Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 30, 1984, Ser. No. 635,979

Int. Cl.[4] H03M *1/12*

U.S. Cl. 340—347 AD **9 Claims**



1. A digital processor for converting an analog signal into a digital bit stream signal comprising:

source means for providing a dithering signal;

mixing means for mixing said provided dithered signal with an analog signal;

clipping means for clipping the mixed signal from said mixing means; and

sampler means for sampling the clipped signal from said clipping means at a desired rate so as to produce a digital bit stream signal.

4,594,576

CIRCUIT ARRANGEMENT FOR A/D AND/OR D/A CONVERSION WITH NONLINEAR D/A CONVERSION

Katsuyoshi Fujii, Osaka, Japan, assignor to Matsushita Electric Industrial Company, Limited, Japan

Filed Jun. 24, 1983, Ser. No. 507,541

Int. Cl.[4] H03K *13/02, 13/04*

U.S. Cl. 340—347 AD **10 Claims**

1. A circuit arrangement for converting an input analog signal into an output digital signal, comprising:

(a) a comparator having first and second input terminals for respectively receiving said input analog signal and a reference signal;

(b) a successive approximation register responsive to an output signal from said comparator for prodcuing said output digital signal; and

(c) a nonlinear digital-to-analog converter means responsive to said output digital signal from said successive approximation register for producing said reference signal,

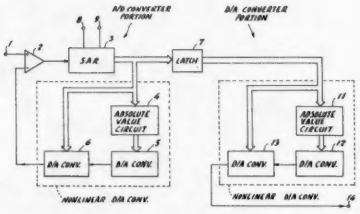
said nonlinear digital-to-analog converting means including:

(i) an absolute value circuit responsive to said output

digital signal for producing an absolute value digital signal;

(ii) a digital-to-analog converter responsive to said absolute value digital signal for converting the same into an analog signal; and

(iii) a further digital-to-analog converter having function of multiplication and responsive to said analog signal



from said first-mentioned digital-to-analog converter and to said output digital signal for producing an analog signal indicative of the result of multiplication between said analog signal from said first-mentioned digital-to-analog converter and said output digital signal, where said result multiplication corresponds to the square of said output digital signal from which polarity has been removed.

4,594,577

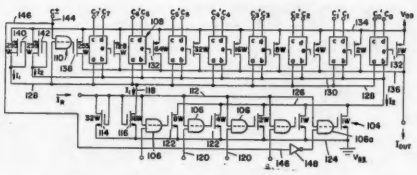
CURRENT MIRROR DIGITAL TO ANALOG CONVERTER

Roger A. Mao, Cupertino, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Division of Ser. No. 183,171, Sep. 2, 1980, Pat. No. 4,384,274, which is a division of Ser. No. 50,961, Jun. 22, 1979, abandoned. This application Sep. 24, 1982, Ser. No. 650,120

Int. Cl.[4] H03K *13/03*

U.S. Cl. 340—347 DA **4 Claims**



1. A nonlinear current mirror digital to analog converter for providing an analog output signal from binary data signals in accordance with the "μ225" law, said binary data signals including a first set of signals defining a chord and a second set of signals defining a step, said converter comprising:

a first input transistor connected to a current source;

a second transistor, the current flowing through said second transistor being proportional to the current from said current source;

a first set of linear logic gates, each having a first input lead connected to said current source and a second input lead connected to a data source for designating steps of the "μ255" law curve, each gate within said first set of linear logic gates providing an output signal on an output lead;

a first set of transistors, each corresponding to one of said linear logic gates, the current through each transistor within said said first set of transistors being proportional to the current through said first transistor in response to the output signal from said associated linear logic gate;

a second set of transistors;

a second set of linear logic gates, each linear logic gate within said second set having a first digital input lead and a second digital input lead for receiving data signals designating the chords of the "μ255" law curve, each of said logic gates within said second set of logic gates corresponding to a transistor within said second set of transistors, each transistor within said second set of transistors conducting a current proportional to the current from said current source when the signal at the first digital input lead of said corresponding linear logic gate is in a first binary state, each transistor within said second set of transistors conducting a current proportional to the total amount of current through said first set of transistors when the signal present at the second digital input lead of said corresponding logic gate is in said first binary state; and

an output lead for conducting an amount of current equal to the total current flowing through said second set of transistors.

4,594,578

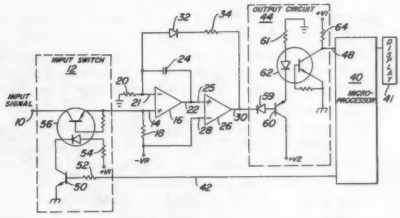
ONE SHOT PULSE WIDTH MODULATING CONVERTER

Thomas J. Walsh, Hatboro, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed Aug. 22, 1984, Ser. No. 643,210

Int. Cl.[4] H03M *1/12*

U.S. Cl. 340—347 AD **7 Claims**



1. A single shot pulse width modulating converter for converting the voltage amplitude of an input signal to a voltage pulse of width proportional to the amplitude of said input signal, comprising:

a source of reference potential;

an integrating amplifier circuit;

a comparator connected to compare the output of said integrating amplifier to said reference potential;

a first switching means operable to connect said input signal as an input to said integrating amplifier during a periodic fixed sampling period;

a feedback circuit connected between the output of said comparator and the input of said integrating amplifier so that the current in said feedback circuit will maintain the output of the integrating amplifier circuit at said reference potential when the output of said comparator is of one polarity, said feedback circuit including switchable means operable to maintain disconnected when the output of said comparator is of an opposite polarity; and

an output circuit connected to the output of said comparator and operable to produce as a final output signal a voltage waveform which changes state with a change in polarity of said comparator output signal so that the pulse width of said final output signal is related to the voltage amplitude of the input signal.

4,594,579
APPARATUS FOR DIGITALLY SUBDIVIDING ANALOG PERIODIC SIGNALS

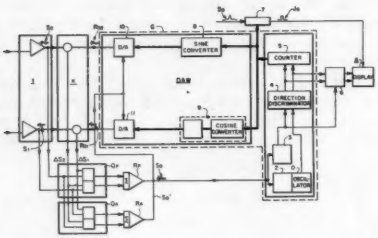
Walter Schmitt, Traunreut, and Franz Ritz, Ubersee, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 20, 1983, Ser. No. 459,374

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, 3202356

Int. Cl.[4] H03K *13/02;* **G08C** *19/16*

U.S. Cl. 340—347 SY **18 Claims**



1. In combination with means for generating at least two periodic analog signals having a period P, a system for subdividing the periodic analog signals, said systems comprising:

a signal generator which comprises means for generating one respective periodic analog reference signal for each analog signal, each respective reference signal having the period P;

a comparator responsive to the at least two analog signals and the at least two reference signals, said comparator comprising means for generating an analog control signal indicative of the momentary amplitude differences between the analog signals and the reference signals;

an oscillator responsive to the analog control signal, said oscillator comprising means for generating a series of pulses, the number of which varies as a function of the control signal;

means, included in the signal generator, for shifting the phase of the reference signals as a function of the series of pulses to cause the phase of the reference signals to correspond to the phase of the respective analog signals, such that a preselected number of the pulses causes the reference signals to cycle through a full period P and thereby determines a subdivision factor of the full period P for the analog signals; and

means for maintaining a continuous digital count of the series of pulses as a digital indication of the phase angle of the periodic analog signals.

4,594,580
EXPANDED-CAPACITY WIRELESS SECURITY SYSTEM WITH DUAL-RANGE ENVIRONMENTAL MONITORING AND CONTROL

Jack Nelson, East Brunswick, N.J., assignor to Wems/International Controls, Inc., Cherry Hill, N.J.

Filed Dec. 12, 1984, Ser. No. 680,628

Int. Cl.[4] G08B *19/00*

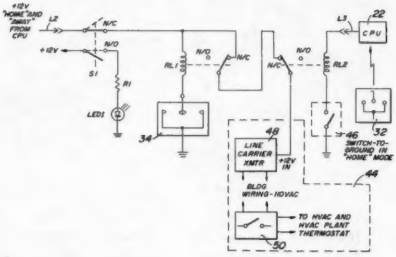
U.S. Cl. 340—521 **6 Claims**

1. A wireless security system comprising:

(a) a central processing unit;

(b) at least one primary condition-responsive monitoring device for wireless communication with the central processing unit, the primary condition-responsive monitoring device being arranged to monitor and respond to a parameter representative of a condition being monitored over a first range of values of the parameter and to communicate with the central processing unit when the parameter falls outside the first range;

(c) at least one secondary condition-responsive monitoring device for wired communication with the central processing unit, the secondary condition-responsive monitoring device being arranged to be selectively switched into and out of electrical series connection with the primary condition-responsive monitoring device and arranged to monitor and respond to the same parameter representative of the condition being monitored over a second range of



values of the parameter and to communicate with the central processing unit when the parameter falls outside the second range, the second range of values being greater than or equal to the first range of values; and

(d) switch means for selectively switching the secondary condition-responsive monitoring device into and out of electrical series connection with the primary condition-responsive monitoring device.

4,594,581
FIRE ALARM SYSTEM

Kiyoshi Matoba, Tokyo, Japan, assignor to Nohmi Bosai Kogyo Co. Ltd., Tokyo, Japan

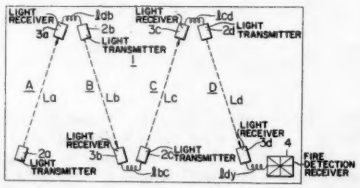
PCT No. PCT/JP83/00188, § 371 Date Jan. 10, 1984, § 102(e) Date Jan. 10, 1984, PCT Pub. No. WO83/04450, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 7, 1983, Ser. No. 572,425

Claims priority, application Japan, Jun. 8, 1982, 57-96948

Int. Cl.[4] G08B *1/00, 17/10*

U.S. Cl. 340—531 **16 Claims**



1. A method of operating a fire alarm system, comprising the steps of:

employing at least two extinction-type smoke detectors each having a light transmitter and a light receiver separate from said light transmitter;

employing said at least two extinction-type smoke detectors for detecting smoke by measuring an attenuation in the presence of smoke of a light beam transmitted from said light transmitter to said separate light receiver;

detecting a physical parameter;

evaluating said physical parameter by electronic circuitry;

generating an information-bearing signal in response to said evaluation of said physical parameter; and

utilizing at least one light beam of said at least two extinc-

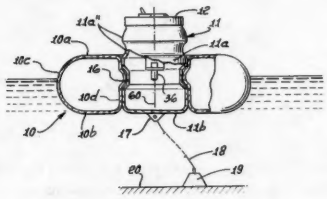
tion-type smoke detectors as a carrier for transmitting said information-bearing signal.

4,594,582

FLOATING ALARM UNIT FOR POOL OR SPA

Stanley C. Thompson, 7851 Talbert St., Apt. 1, Playa del Rey, Calif. 90271

Filed Jul. 18, 1983, Ser. No. 514,493
Int. Cl.[4] G08B *13/00*
U.S. Cl. 340—566 **10 Claims**



1. In a pool or spa alarm unit, the combination comprising:
(a) a float body adapted to float on a pool of water, said body being annular and forming a central vertical through opening, the body being annularly hollow about said through opening,
(b) a hollow container protectively vertically received in said opening formed by said body to be attached to an inner wall formed by said annular body and to be carried by the body, said container and hollow body having thin, annular flexible, correspondingly annularly corrugated walls which have interfering, annular tonge and groove interfit inwardly of the hollow in the float body and outwardly of the hollow in the container, the bottom of the hollow container being substantially flush with the bottom of the hollow body, and
(c) tilt sensing means in said hollow container and within said central opening, to be placed in an alarm mode in response to water wave induced tilting of said body,
(d) said container including a removable lid attached to the container above the level of the annular body, said tilt sensing means carried by the lid to be accessible in response to removal of the lid from the container,
(e) and said tilt sensing means including a pendulum suspended by said lid, and circuitry responsive to swinging of the pendulum to produce an alarm signal,
(f) the pendulum surrounded by said annular float body.

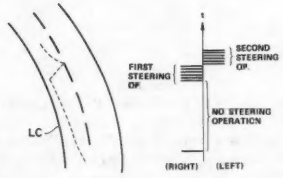
4,594,583

METHOD AND SYSTEM FOR DETECTION OF DRIVER DROWSINESS BY AN ABRUPT STEERING CHANGE FOLLOWING NO STEERING MOVEMENT

Yasutoshi Seko, Yokohama; Haruhiko Iizuka, Yokosuka; Takayuki Yanagishima, Yokosuka, and Hideo Obara, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 15, 1984, Ser. No. 580,178
Claims priority, application Japan, Feb. 18, 1983, 58-24606
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—576 **23 Claims**

1. A method for detecting driver drowsiness in an automotive vehicle, comprising the steps of:
(a) monitoring a position of a vehicular steering wheel and signalling direction and magnitude of change in the position of the steering wheel;
(b) measuring a first duration of a period of time during which no noticeable changes in the position of the steering wheel are monitored;
(c) determining whether said first duration of period of time measured in said step (b) is longer than any one of a plurality of given periods of time;
(d) if said first duration is longer than one of said time periods, selecting one of a plurality of sets of predetermined conditions in accordance with said first duration;
(e) determining whether noticeable changes in the position of the steering wheel immediately following said first duration satisfy said selected one of said plurality of sets of predetermined conditions; and



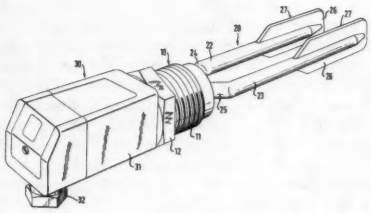
(f) activating an alarm device indicating driver drowsiness when said first duration is determined to be longer than one of said plurality of given periods of time in said step (c) and said noticeable changes in the position of the steering wheel determined in said step (e) satisfy said selected one of said sets of predetermined conditions selected in said step (d).

4,594,584

DEVICE FOR DETERMINING AND/OR MONITORING A PREDETERMINED FILLING LEVEL IN A CONTAINER

Helmut Pfeiffer, Lörrach; Volker Dreyer, Lörrach-Haagen, and Martin Pfändler, Steinen, all of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 656,367
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336991
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—620 **20 Claims**



1. A device for monitoring a predetermined filling level in a container, comprising a mechanical oscillatory structure having a diaphragm held at its edge region, two oscillatory rods secured to said diaphragm in a spaced relationship so as to project into said container, and a bridging member held at a spacing from said diaphragm at the side remote from said oscillatory rods by flexurally elastic rod-shaped supports each connected rigidly at one end to an oscillatory rod, further comprising an excitation arrangement for imparting to said oscillatory rods oscillations in opposite directions transversely to the longitudinal direction of said rods, said excitation arrangement having an excitation transducer with at least one piezoelectric element excitable by an AC voltage and a reception transducer with at least one piezoelectric element converting the oscillations of the mechanical oscillatory structure into an electrical output signal, the piezoelectric elements of said

excitation transducer and of said reception transducer being arranged in a stack which is held, with preloading of said diaphragm, between said bridging member and the portion of said diaphragm which is situated between said oscillatory rods, and further comprising an evaluation circuit for initiating at least one of a display and switching operation in response to the output signal of said reception transducer.

4,594,585

ELECTROMAGNETICALLY-CONTROLLED FLAT KNITTING MACHINE

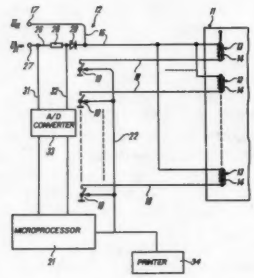
Gerd Mak, Reutlingen, and Jürgen Ploppa, Pfullingen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH and Company, Reutlingen, Fed. Rep. of Germany

Filed Jan. 26, 1984, Ser. No. 573,946

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304360

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—679 **6 Claims**



1. In an electromagnetically-controlled knitting machine of the kind including electromagnetic means incorporating a setting magnet with a winding having a response voltage and supervising means for checking the functional readiness of said magnet, said supervising means including a microprocessor with a detecting and indicating device and a measuring tracer for closed and open circuits, measurements from said measuring tracer being transmitted in sequence through an intermediate unit for display by said detecting and indicating device, the improvement comprising

means for applying to said setting magnet an auxiliary direct voltage of an intensity less than said response voltage of said winding of said setting magnet, the connection of said measuring tracer through a measuring conductor passing said auxiliary voltage to a measuring resistance connected to said setting magnet, wherein said intermediate unit includes an analog to digital converter having an input which is connected to said measuring resistance, and wherein the functional readiness of said setting magnet is defined by existing and target values, said microprocessor calculating said target values, and obtaining corrective values from said existing and said target values, and,

signalling means indicating operative data on said detecting and indicating device, said operative data including an impedance and a characteristic curve of said setting magnet, and said existing and said target values,

said corrective values being displayed on said signalling means.

4,594,586

X-Y POSITION INPUT DEVICE FOR DISPLAY SYSTEM

Junichi Hosogoe, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 8, 1983, Ser. No. 521,320

Claims priority, application Japan, Aug. 7, 1982, 57-119451[U]; Aug. 7, 1982, 57-119458[U]

Int. Cl.⁴ G09G *1/00*

U.S. Cl. 340—710 **4 Claims**

1. An X-Y input device comprising a rotatable ball, a first driven roller held in contact with said rotatable ball and rotatable in response to rotation of said rotatable ball, a second driven roller held in contact with said rotatable ball and rotatable in response to rotation of said rotatable ball, said second driven roller having an axis of rotation extending substantially perpendicularly to that of said first driven roller, first angle detector means for detecting an angle of rotation of said first driven roller, and second angle detector means for detecting an angle of rotation of said second driven roller, each of said first and second driven rollers comprising a hub having a through hole with a rotatable shaft extending therethrough, an outer cylinder spaced radially outwardly from said hub, a plurality of connectors extending radially from said hub to said outer cylinder, and a plurality of sectorial recesses defined between said hub and said outer cylinder and divided by said connectors.

4,594,587

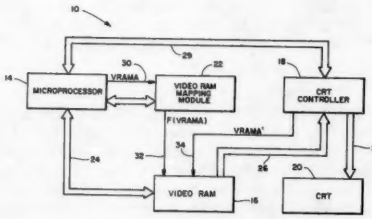
CHARACTER ORIENTED RAM MAPPING SYSTEM AND METHOD THEREFOR

Gregg Chandler, and Babu Rajaram, both of St. Joseph, Mich., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 30, 1983, Ser. No. 527,945

Int. Cl.⁴ G09G *1/00*

U.S. Cl. 340—750 **10 Claims**



1. In a video display system including a raster-scanned video display unit, a video display processor, a digital data memory coupled to said video display processor and responsive to output signals therefrom, said digital data memory including a first plurality of addressable memory locations for generating a first digital X-Y matrix, bit-mapping address signal defined by a plurality of locations each containing a pixel data bit and including m low order bits and n higher order bits representing the column and row coordinates, respectively, of a given location on said video display unit, and a video display unit controller coupling said video display processor and said digital data memory to said video display unit for presenting video information thereon, said video display unit controller having

a second plurality of addressable memory locations therein each representing a given location on said video display unit and responsive to a second address signal comprised of x higher order bits representing a given position along a scan line on said video display unit and y lower order bits representing a given scan line on said video display unit, wherein said first and second address signals are represented in binary form to the base A, where A is a multiple of 2 and

$$m+n=X+Y,$$

and one scan line of said video display unit is comprised of A bytes of video information, a method for converting said first address signal to said second address signal for driving said video display unit controller comprising:

shifting the m low order bits of said first address signal toward the higher order bits therein y data bit locations;

shifting the y lowest order bits of said n higher order bits of said first address signal toward the lower order bits therein m data bit locations, in generating a first intermediate address signal having

$$(n-y)+(m=y)$$

higher order bits and a plurality of low order bits;

converting the higher order bits of said first intermediate address signal to a continuous mapping function in generating a second intermediate address signal, whereby a continuous, 1:1 correlation exists between the respective locations on said video display unit represented by said first and second address signals; and

providing said second intermediate address signal to said video display unit controller for presenting video information on said video display unit in terms of said X-Y matrix, bit mapping address signal.

4,594,588

PLASMA DISPLAY MARGIN CONTROL

Terry W. Barclay; John R. Cielo, both of Kingston, N.Y.; William J. Martin, San Jose, Calif., and James B. Trushell, Saugerties, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,778

Int. Cl.[4] G09G *3/22*

U.S. Cl. 340—771 **7 Claims**

1. A control system for automatically determining the operating sustain voltage margin and optimum operating point of the sustain signal within said margin for a plasma display device, said operating sustain voltage margin comprising the difference between a maximum and minimum sustain signal amplitude comprising, in combination,

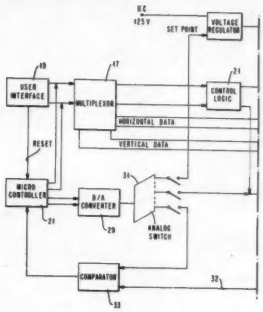
a high resolution plasma display device comprising orthogonally disposed conductor arrays having drive and control circuitry associated with the horizontal and vertical axes of said device,

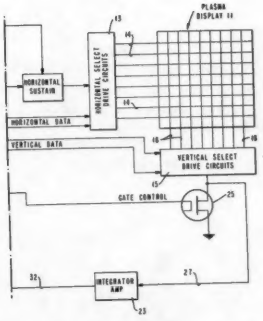
the intersections of said conductor arrays defining plasma display cells,

means for generating and applying a test pattern of write and sustain signal sequences to the conductors of at least one of said arrays of said plasma display device whereby a plurality of cells in said plasma display are selectively discharged and sustained,

means for applying signals generated by a sustain signal-ranging algorithm to one of said conductor arrays and measuring the resulting discharge current from the conductors of said other array of said plasma display device, and

means for comparing said discharge current resulting from said test pattern to the signals generated by said sustain signal ranging algorithm to establish a minimum operating point,





said discharge current corresponding in magnitude to the number of cells discharged.

4,594,589

METHOD AND CIRCUIT FOR DRIVING ELECTROLUMINESCENT DISPLAY PANELS WITH A STEPWISE DRIVING VOLTAGE

Toshihiro Ohba, Nara; Hiroshi Kinoshita, Tenri; Yoshiharu Kanatani, Nara, and Hisashi Uede, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 27, 1982, Ser. No. 412,377

Claims priority, application Japan, Aug. 31, 1981, 56-137929; Aug. 31, 1981, 56-137930; Sep. 30, 1981, 56-157145; Sep. 30, 1981, 56-157148

Int. Cl.[4] G09G *3/12*

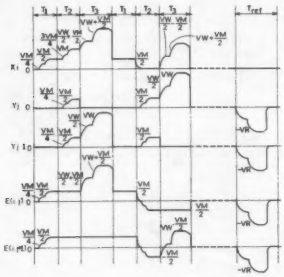
U.S. Cl. 340—805 **17 Claims**

1. A system for driving an electro-luminescent (EL) element with a stepwise driving waveform for reduced power consumption comprising:

first charge circuit means for alternately applying a net charge voltage of one of two polarities across said element to charge said element, said charge voltage being less than a threshold voltage necessary to illuminate said element;

write circuit means for applying a write voltage to develop a net voltage across said element by adding to and subtracting from respective ones of said two polarities of charge voltages, the net voltage developed by adding said write voltage to said charge voltage being sufficient to exceed said threshold voltage, said net voltage when developed by subtracting said charge voltage from said write voltage being insufficient to exceed said threshold voltage;

two step write voltage supply means for supplying said write voltage to said write circuit means in two steps, a first step supplying a substantial portion of said write voltage to



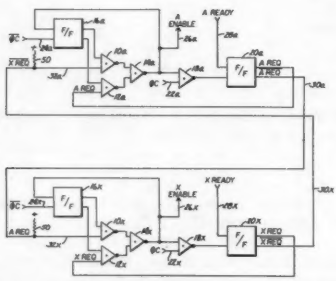
said write circuit means for supply to said element while the remaining portion of said write voltage is supplied subsequently thereto in a second step.

4,594,590

DEMAND DRIVEN ACCESS MECHANISM

David A. Van Hatten, and Herman T. Nielsen, both of New Brighton, Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 4, 1983, Ser. No. 548,791
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.51 **9 Claims**



1. In a communication system having a plurality of stations each capable of seizing use of a communications channel shared by said stations, the improvement comprising, at each station, a demand driven access mechanism for enabling the respective station to seize use of the channel, said mechanism comprising:

A. first logic means responsive to the respective station for producing a station request signal whenever the respective station is ready to seize use of the channel, and for producing a station not-request signal whenever the respective station is not ready to seize use of the channel;

B. second logic means for producing an enable signal, said second logic means comprising:

(i) storage means having a true output and a false output, and

(ii) gate means having an output and having inputs' connected to the true and false outputs of said storage means, the respective station's request signal and the other stations' not-request signals to produce said enable signal at its output whenever said gate means receives said true output from said storage means and the other stations' not-request signals or receives said false output from said storage means and the station's request signal,

said storage means having a data input connected to the output of said gate means and having a clock input connected to a source of clock signals;

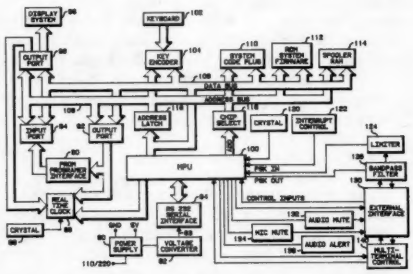
C. output means for providing said enable signal to the respective station.

4,594,591

GENERAL PURPOSE DATA CONTROL TERMINAL

Timothy M. Burke, Fort Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 402,687, Jul. 28, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 695,749
Int. Cl.[4] H04Q *9/00, 7/00*
U.S. Cl. 340—825.07 **3 Claims**



1. In a register modelled communication system for data and voice communications, having at least one primary station and a plurality of remote stations, each remote station having a predetermined station address, and each station adapted to transceive data signals including at least a command data packet, a data terminal for the primary station, comprising:

means for entering a remote station address;

generating means, coupled to said entering means, for generating a data command packet containing at least an operation code, an argument and said remote station address, including means for transmitting same to the primary station;

means for receiving a remote command data packet from the primary station, including at least one register means for receiving the remote operation code and argument;

display means, coupled to said receiving means, for displaying the predetermined station address from said remote command data packet; and

means for executing the remote operation code, from said remote command data packet, in cooperation with said argument.

4,594,592

AIRPLANE SAFE TAKE-OFF ROTATION INDICATOR

Leonard M. Greene, P.O. Box 550, White Plains, N.Y. 10602

Filed Jan. 9, 1984, Ser. No. 569,478
Int. Cl.[4] G08B *21/00, 23/00*; G08G *5/00*; G06F *15/48*
U.S. Cl. 340—959 **4 Claims**

1. A system for indicating the attainment of a minimum safe speed for take-off rotation of an airplane rolling down a runway in situations where a head wind may decrease after take-off comprising:

airspeed sensing means for sensing the airspeed of the aircraft and generating an airspeed signal representative thereof,

ground speed sensing means for sensing the ground speed of the aircraft along the runway and generating a ground speed signal representative thereof,

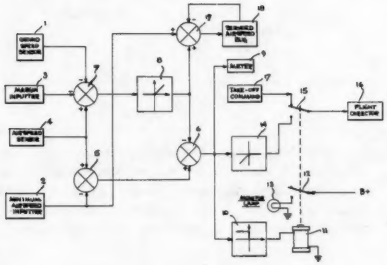
margin means for generating a margin signal representing a ground speed margin,

minimum airspeed means for generating a minimum airspeed

signal representing an operator preselected minimum airspeed,

first summing means for receiving said ground speed, margin, and airspeed signals and generating a signal in accordance with the difference between said airspeed signal and the sum of said ground speed and margin signals,

clipper means for receiving the output signal of said first summing means and providing a zero output signal when the difference signal output of said first summing means is less than zero and an output signal which is in accordance with the signal output of said first summing means when



said first summing means output signal is greater than zero,

second summing means for receiving said airspeed signal and said minimum airspeed signal and generating a signal in accordance with the difference therebetween,

third summing means for receiving the outputs of said clipper means and said second summing means and providing an output signal in accordance with the difference therebetween, and

indicator means for indicating the attainment of minimum safe speed for take-off rotation in response to the output of said third summing means.

4,594,593

SYNTHETIC APERTURE RADAR IMAGE PROCESSING SYSTEM

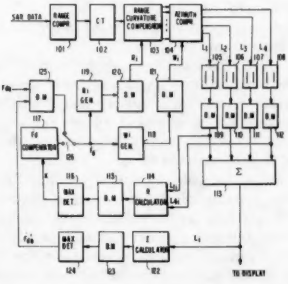
Hitoshi Nohmi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 454,139

Claims priority, application Japan, Dec. 28, 1981, 56-210343; Dec. 28, 1981, 56-210344

Int. Cl.[4] G01S *13/90*

U.S. Cl. 343—5 CM **16 Claims**



1. An SAR image processing system wherein an image is reproduced from received SAR data through range compression, range curvature compensation and azimuth compression using a range reference function, a range curvature compensation function and an azimuth reference function, respectively, comprising:

means for developing a correlation coefficient between two look image signals which are obtained by dividing an azimuth-compressed signal into plural looks for each of predetermined relative shift amounts between said two look image signals;

means for selecting and generating a relative shift amount K_{max} giving the maximum correlation coefficient from among the developed correlation coefficients;

azimuth reference function generating means for generating said azimuth reference function based on said shift amount K_{max}; and

range curvature compensation function generating means for generating said range curvature compensation function based on said relative shift amount K_{max}.

4,594,594

LORAN SIGNAL RECEIVER

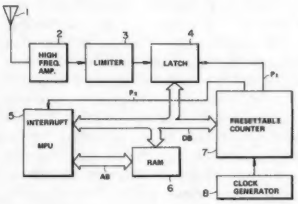
Hiroshige Fukuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 4, 1984, Ser. No. 608,576

Claims priority, application Japan, Sep. 2, 1983, 58-161724

Int. Cl.[4] G01S *1/24*

U.S. Cl. 343—389 **13 Claims**



1. A loran-C signal receiver comprising:

(a) a sample means for periodically sampling a received signal containing a loran-C signal in response to sampling pulses produced periodically in synchronism with the carrier wave of the loran-C signal to produce sampled data values;

(b) a memory means;

(c) a computer means for:

(1) storing the data values sampled in two successive periods of the loran-C signal in corresponding first and second period areas of said memory means;

(2) adding the sampled data values of the next successive pair of periods of the loran-C signal to corresponding sampled data values stored in said memory;

(3) repeating the adding operation for a plurality of subsequent first and second periods of the loran-C signal;

(4) reading groups of a fixed number of totalled values from the memory, the fixed number matching the number of pulses in each loran pulse group, the totalled values being read from memory addresses separated in coincidence with the separation of pulses in each loran pulse group;

(5) processing each group of read values in accordance with the known phase codinng of each group of loran pulses, the processing indicating whether every value of the group matches the known phase of any of the loran pulse group;

(6) repeating the reading and processing steps until every possible combination of totalled values satisfying the separation criterion has been processed; and

(7) locating each of the loran pulse groups within each pair of successive loran-C signal periods according to

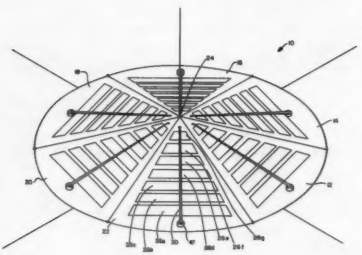
which groups of values exactly match the known phase coding of each loran-C pulse group.

4,594,595

CIRCULAR LOG-PERIODIC DIRECTION-FINDER ARRAY

Keith A. Struckman, Hollis, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Apr. 18, 1984, Ser. No. 601,420
Int. Cl.[4] H01Q *11/10*
U.S. Cl. 343—770 **8 Claims**



1. An antenna array having a central feed region and comprising a plurality of antenna subarrays having longitudinal axes thereof extending outward in different directions from the central feed region, each antenna subarray comprising:

A. a ground-plane conductor having a substantially log-periodic arrangement of slots therein arrayed along the axis of that subarray and thereby defining low-frequency and high-frequency ends of the subarray, the high-frequency end being disposed near the central feed region, the low-frequency end being remote from the central feed region;

B. a traveling-wave element extending along the subarray on one side of the ground-plane conductor between its high-frequency and low-frequency ends for cooperation with the ground-plane conductor to support therewith propagation of electromagnetic waves in a forward direction along the subarray, the end of the traveling-wave element at the high-frequency end of the subarray being adapted for coupling to a transmitter or receiver; and

C. cavity-defining conductor means associated with each slot and defining a cavity disposed on the other side of the ground-plane conductor and opening at its associated slot, the depths of the cavities being such as to give the subarray a sensitivity to electromagnetic radiation received from the direction of the high-frequency end of the subarray that is lower than its sensitivity to radiation received from the direction of the low-frequency end of the subarray.

4,594,596

LASER BEAM RECORDING METHOD

Tsunehiko Takahashi, Asaka, and Sigenori Yoneya, Tokyo, both of Japan, assignors to Fuji Photo Filmco., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 164,948, Jul. 1, 1980. This application Mar. 14, 1985, Ser. No. 710,955
Claims priority, application Japan, Jul. 4, 1979, 54-84661
Int. Cl.[4] G01D *9/40, 15/14*
U.S. Cl. 346—76 L **7 Claims**

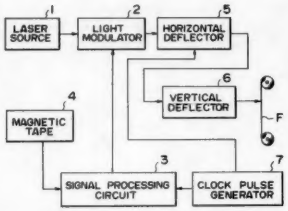
1. A laser beam recording system for recording information in the form of characters and/or marks on a recording material, said system comprising:

a laser source for producing a laser beam;

modulating means responsive to an input signal for modulating said laser beam;

first deflector means for deflecting said modulated laser beam in a main scanning direction to record an image on the recording material;

second deflector means for deflecting said first deflected modulated laser output in a sub-scanning direction perpendicular to the main scanning direction to record a further image on the recording material; and



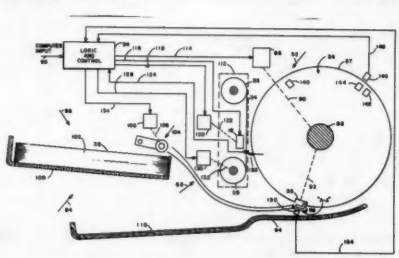
signal processing means for producing said input signal for use by said modulating means, said signal processing means including means for generating a dot signal, and means for extending the duration of said dot signal, said extended dot signal constituting said input signal.

4,594,597

THERMAL PRINTER

Dean-Yuan Liu, Canoga Park; Jon S. Guy, Garden Grove; Howard W. H. Siu, S. San Gabriel, and Michael A. Shaver, Santa Fe Springs, all of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 13, 1985, Ser. No. 765,079
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **7 Claims**



1. In a thermal printer having a thermal print head for selectively generating points of heat traversely across a print path and a driven ribbon having a transferable print medium thereon transported through the space between the print head and a sheet of print receiving media, the improved print media and ribbon drive comprising:

(a) a horizontally disposed rotatable cylindrical drum having the print head in close adjacent parallel-spaced relationship to said drum's outer surface and the ribbon passing between the print head and said outer surface;

(b) releasable clamping means for clamping the edge of a sheet of receiving media to said surface;

(c) drive means for rotating said drum in a first direction being the printing direction and in a second direction, opposite said first direction, being the release direction and for stopping said drum and at first point with said clamping means adjacent the print head when said drum is rotating in said printing direction being the top of sheet point and at a second point with said clamping means adjacent the lowest point of said drum's rotational path when said drum is rotating is said release direction being the release point;

(d) clamp release means carried by said drum and operably connected to said drive means for releasing said clamp means only as said drum is being stopped at said release point when rotating in said release direction;

(e) first guide means for directing a sheet of receiving media onto said suface with its leading edge disposed in said released clamping means when said drum is stopped at said release point;

(f) second guide means for receiving and guiding a sheet of receiving media off of said surface when said drum is rotated between said top of sheet point and said release point in said release direction and said clamping means is released; and,

(g) control means connected to said drive means and the driven ribbon for rotating said drum in said print direction to clamp a sheet of receiving media, rotating said drum in said print direction to said top of sheet position, positioning the ribbon at the top of its first color, step rotating said drum in said print direction and stepping the ribbon in synchronization therewith while printing the first color line by line, positioning the ribbon at the top of its second color, step rotating said drum in said print direction and stepping the ribbon in synchronization therewith while printing the second color line by line, positioning the ribbon at the top of its third color, step rotating said drum in said print direction and stepping the ribbon in synchronization therewith while printing the third color line by line, and rotating said drum in said release direction to said release position to unclamp and eject the printed receiving media.

4,594,598

PRINTER HEAD MOUNTING ASSEMBLY IN AN INK JET SYSTEM PRINTER

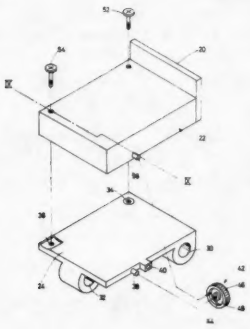
Fusao Iwagami, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1983, Ser. No. 543,605

Claims priority, application Japan, Oct. 26, 1982, 57-188457

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **2 Claims**



1. An ink jet system printer comprising:

a printer head including a nozzle unit in a front face thereof, said nozzle having at least two orifices aligned in the lateral direction;

a carriage supporting said printer head;

drive means for shifting said carriage in said lateral direction;

support means for rotatably supporting one edge of said printer head on said carriage, said support means including a cylindrical sheet formed on said carriage, a cylindrical protrusion formed on an undersurface of said printer head at a position corresponding to said cylindrical sheet, a spherical sheet formed on said carriage and laterally opposed to said cylindrical sheet, and a spherical protrusion formed on an undersurface of said printer head at a position corresponding to said spherical sheet;

adjusting means provided on the opposing edge of said printer head for adjusting the inclination of said printer head on said carriage for accurately aligning said at least two orifices in said lateral direction, said adjusting means including a variable radius cam rotatably secured to said carriage on a cam shaft thereof and a cam actuator secured to said printer head, wherein said variable cam interacts with said cam actuator to accurately align said at least two orifices in said lateral direction; and

locking means for locking said adjusting means, wherein said locking means is operable independently of said adjusting means.

4,594,599

IMAGE RECORDING METHOD

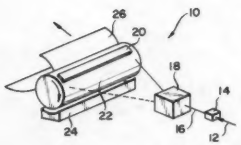
Satoru Tomita, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,343

Claims priority, application Japan, Jan. 13, 1984, 59-5190; Jan. 13, 1984, 59-5191; Jan. 24, 1984, 59-11603; Jan. 24, 1984, 59-11604; Jan. 24, 1984, 59-11605; Jan. 24, 1984, 59-11606

Int. Cl.[4] G01D *15/14, 9/42;* **H04N** *1/23*

U.S. Cl. 346—160 **13 Claims**



1. In an image recording method using an optical scan type electrophotographic recording apparatus which includes means for varying a pulse width of video data which modulate a light beam, the improvement wherein a light beam scans such that at a boundary between an image portion and a non-image portion a ratio of a light beam exposing time to a one-pixel scanning time satisfies a condition $0.2 \leqq Td \leqq 1.1$.

4,594,600

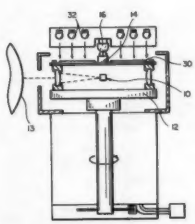
INTEGRATED LASER DIODE SCANNER

Sanjiv Arora, Sunnyvale, Calif., assignor to Ricoh Company, Ltd., Tokyo, Japan and Ricoh Systems, Inc., San Jose, Calif.

Filed Oct. 11, 1984, Ser. No. 659,771

Int. Cl.[4] G01D *15/14*

U.S. Cl. 346—160 **17 Claims**



1. An integrated laser diode scanner for scanning an information modulated laser beam across a surface comprising a rotating turntable carrying a source of said laser beam, a power source for said laser diode mounted on a further turntable for rotation with said laser source, lens means for focusing said

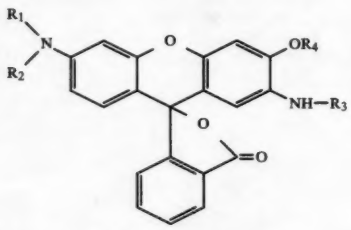
laser output along a transmission path to the surface, and means responsive to an information signal sequence for modulating said laser beam, said laser modulating means comprising a light sensitive device mounted for rotation with said turntable and responsive to a light source containing said modulation information to impress the information on the output of the laser source.

4,594,601
FLUORAN COMPOUNDS

Mitsutoshi Anzai; Masahiko Yamaguchi; Michihiro Gonda; Mikiko Kanasugi, and Toshio Obara, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,333
Claims priority, application Japan, Oct. 1, 1982, 57-171039; Jan. 22, 1983, 58-8094
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—221 **8 Claims**

1. A heat sensitive record sheet which comprises a support sheet and a coated layer on the support sheet comprising a fluoran compound having the formula:

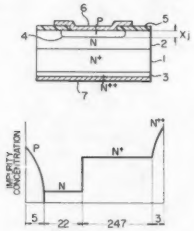


wherein each R_1 and R_2 is a C_1–C_4 alkyl group, a cycloalkyl group or an aryl group, or R_1 and R_2 form together with N a saturated ring, R_3 is a benzyl or phenyl group which is unsubstituted or is substituted by a methyl group, ethyl group or halogen atom, and R_4 is a C_1–C_4 alkyl group.

4,594,602
HIGH SPEED DIODE

Kenji Iimura, Hitachi, and Yoichi Nakashima, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,166
Claims priority, application Japan, Apr. 13, 1983, 58-66152
Int. Cl.[4] H01L *29/91, 29/167*
U.S. Cl. 357—13 **11 Claims**



1. A high-speed diode comprising:

a semiconductor pellet including a P-layer, an N-layer, and an N^+-layer so as to form a PNN^+ structure, the impurity concentration in the surface of said P-layer being equal to or less than 8×10^{18} atoms/cc and said P-layer having a thickness of 2 to 6 μm to provide a predetermined soft reverse recovery characteristic for the diode, said N-layer having a resistivity of 5Ω-cm or more and a thickness of 19 to 25 μm, the carrier lifetime in said N-layer being in a range from 20 to 40 nanoseconds;

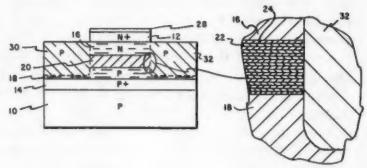
a first electrode kept in ohmic contact with said P-layer; and

a second electrode kept in ohmic contact with said N^+-layer.

4,594,603
SEMICONDUCTOR DEVICE WITH DISORDERED ACTIVE REGION

Nick Holonyak, Jr., Urbana, Ill., assignor to Board of Trustees of The University of Illinois, Ill.

Division of Ser. No. 370,756, Apr. 22, 1982, Pat. No. 4,511,408. This application Jan. 24, 1985, Ser. No. 694,730
Int. Cl.[4] H01L *33/00;* H01S *3/19*
U.S. Cl. 357—16 **10 Claims**



1. A semiconductor device, comprising;

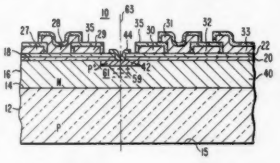
a semiconductor support layer;

a disordered alloy converted from at least a first active semiconductor region and a second semiconductor barrier layer that have been disordered by introduction of a disordering element selected from the group consisting of silicon and krypton such that the alloy exhibits a higher energy gap than the first active semiconductor region.

4,594,604
CHARGE COUPLED DEVICE WITH STRUCTURES FOR FORWARD SCUPPERING TO REDUCE NOISE

Francis J. Kub, Pasadena, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,168
Int. Cl.[4] H01L *29/78, 27/14, 31/00;* G11C *19/28*
U.S. Cl. 357—24 **25 Claims**



1. Apparatus for removing charge from a charge coupled device at selected times comprising:

a substrate of P-type semiconductor material,

a layer of N-type semiconductor material above said substrate,

a layer of insulation over said layer of semiconductor material,

a plurality of electrodes positioned on said insulation layer adjacent one another for controlling said charge in said N-type layer,

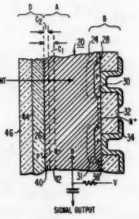
a first P-type region formed in said N-type layer positioned between two of said pluralities of electrodes,

first means for applying a reverse bias potential to said first P-type region with respect to said N-type layer at first times and for applying a forward bias at second times where upon charge in said N-type layer is removed.

4,594,605
IMAGING DEVICE HAVING ENHANCED QUANTUM EFFICIENCY

William M. Kramer, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 28, 1983, Ser. No. 489,303
Int. Cl.[4] H01J *31/00*; H01L *31/00*
U.S. Cl. 357—31 **5 Claims**



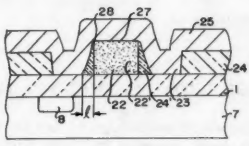
1. In an imaging device of the type having a wafer of single crystal semiconductor material, the wafer having a first surface with an input sensing region and a second surface with a charge storage region, a potential barrier in the sensing region for controlling blooming with the sensing region, a passivation region within said sensing region for stabilizing the atomic energy level along the first surface, an anti-reflection region on said passivation region for reducing reflection and increasing absorption of light incident upon said device, the improvement wherein

said anti-reflection region is formed of first and second contiguous layers, said first layer being formed of a material which is non-interactive with said wafer and having a high index of refraction ranging from about 2.3 to 2.4 which is less than that of said wafer, said first layer being located closer to said wafer than said second layer, said second layer being formed of a material having an index of refraction ranging from about 1.32 to 1.35 which is lower than that of said first layer, and said first and second layers each having an optical thickness substantially equal to a quarter of the wavelength of light incident upon said device.

4,594,606
SEMICONDUCTOR DEVICE HAVING MULTILAYER WIRING STRUCTURE

Hideto Goto, and Haruo Amano, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,545
Claims priority, application Japan, Jun. 10, 1982, 57-99720
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—68 **14 Claims**

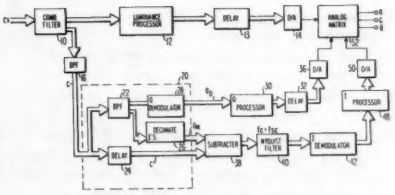


1. A semiconductor device comprising a semiconductor substrate having a major surface, a first insulating layer formed on said major surface, a first extended wiring layer formed on said first insulating layer and having a contact portion having a bottom surface attached to the upper surface of said first insulating layer, said contact portion having a substantially rectangular cross-sectional shape with side walls substantially perpendicular to the upper surface of said first insulating layer and an exposed upper surface extending over the entire width of said first wiring layer, said side walls being coated with a silicon dioxide film, a second insulating layer provided over said first insulating layer and said first wiring layer except at a contact hole area where the entire upper surface of said contact portion and portions of the surface of said first insulating layer on both sides of said contact portion are exposed, said silicon dioxide film being positioned in said contact hole and coating said side walls of said contact portion, said silicon dioxide film having a height substantially equal to the height of said contact portion of said first wiring layer and a thickness gradually tapering from a bottom portion adjacent said first insulating layer to a top portion adjacent said exposed upper surface of said contact portion, said bottom portion of said silicon dioxide film being in contact with the upper surface of said first insulating layer thereby to leave an exposed portion in said first insulating layer at said contact hole, and a second extended wiring layer formed on said second insulating layer and being in contact, in said contact hole, with the exposed portions of the surface of said first insulating layer, the surface of said silicon dioxide film, and the entire upper surface of said contact portion of said first wiring layer.

4,594,607
DEMODULATOR FOR SAMPLED CHROMINANCE SIGNALS INCLUDING A NYQUIST FILTER FOR RECOVERING WIDEBAND I COLOR DIFFERENCE SIGNALS

Henry G. Lewis, Jr., Hamilton Square, and Leonard N. Schiff, Lawrence Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 11, 1984, Ser. No. 619,369
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—23 **8 Claims**



1. In a video signal processor including a source of I and Q chrominance samples, said I chrominance samples representing asymmetrical-sideband modulated I color difference signals wherein the frequency band of a first sideband is wider than a second sideband, and said Q chrominance samples representing double-sideband modulated Q color difference signals plus quadrature crosstalk components of said I color difference signals, apparatus comprising:

separating means responsive to said chrominance samples for providing samples representative of said asymmetrical sideband modulated I signal and of the quadrature crosstalk I signal components of said Q samples to the substantial exclusion of the double-sideband modulated Q signal component of said Q chrominance samples;

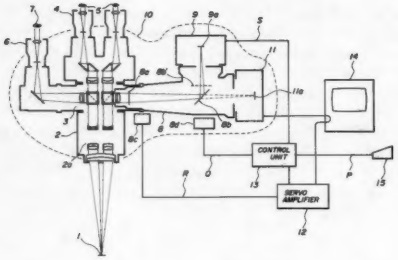
Nyquist filtering means coupled to said separating means for providing a vestigial sedeband modulated signal representing said I signal; and

demodulating means coupled to said Nyquist filtering means for providing samples representative of said I signal and having a substantially uniform range of ampitude values over a frequency band substantially equal in width to said first I signal sideband.

4,594,608
TV-PHOTOGRAPHY SYSTEM FOR SURGICAL MICROSCOPE

Yasuhiko Hatae, Tokyo, and Shigeaki Morimitsu, Hinode, both of Japan, assignors to Hitachi Denshi System Service Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1983, Ser. No. 531,996
Claims priority, application Japan, Sep. 17, 1982, 57-161007
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—93 **5 Claims**



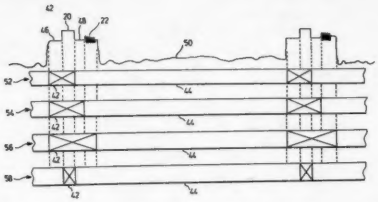
1. A TV-photography system for use in controlling a sterile surgical microscope system comprising:
an objective lens;
an eyepiece;
a beam splitter placed in the optical path between said objective lens and said eyepiece for dividing the optical image produced from said objective lens;
an imaging adapter positioned on said divided portion of said optical image;
a shiftable mirror positioned in said imaging adapter for reflecting the divided optical image from said beam splitter;
a means for placing a television camera in one of the optical paths of said shiftable mirror;
a means for placing a still photographic camera in another optical path of said shiftable mirror; and
shifting means for shifting the position of said shiftable mirror comprising:
control means coupled to said shifting means and to the still photographic camera for successively operating said shiftable mirror and said still photographic camera in accordance with a present sequence; and
humanly operable switch means coupled to said control means for providing a prescribed starting signal to said control means such that upon said control means receipt of said start signal said control means operates such that in the course of displaying a selected region being viewed by said objective lens through a video monitor coupled to the television camera, a still picture of said selective region is automatically taken.

4,594,609
SCRAMBLING SYSTEM FOR TELEVISION VIDEO SIGNAL

Nuno Romao, Scarborough, and Ivica Mudrinic, Weston, both of Canada, assignors to Viewstar Inc., Scarborough, Canada

Filed Jun. 30, 1983, Ser. No. 509,765
Int. Cl.[4] H04N *7/167*
U.S. Cl. 358—119 **145 Claims**

1. A method of scrambling a composite television video signal having intervals containing video information separated by horizontal synchronization pulses the method comprising shifting in time according to a predetermined scheme at least some portions of the composite television signal in a manner to

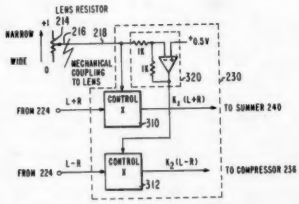


eliminate at least some horizontal synchronization pulses between adjacent intervals containing video information.

4,594,610
CAMERA ZOOM COMPENSATOR FOR TELEVISION STEREO AUDIO

Chandrakant B. Patel, Hopewell, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 15, 1984, Ser. No. 660,967
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—144 **6 Claims**



6. An audio signal processing means for processing L+R and L−R audio signals and adapted for use with a camera having a zoom lens and a sensor coupled to said zoom lens for generating a field-of-view signal representing a particular field-of-view selected, said processing means comprising:
control signal input terminal means adapted to be coupled to receive said field-of-view signal;
first and second audio signal input terminal means adapted to be coupled to receive said L+R and L−R signals, respectively; and
processing means coupled to said control signal input terminal means and to said first and second audio signal input terminal means for controlling the relative magnitudes of said L+R and L−R audio signals in response to said field-of-view signal.

4,594,611
STATION SELECTING METHOD FOR TELEVISION RECEIVER

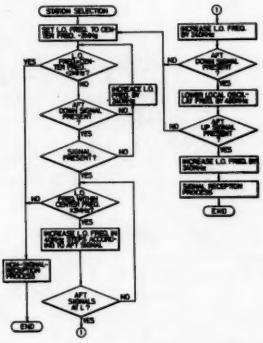
Kiyoshi Sugibayashi; Tomihiro Oguchi, and Hiroyuki Takahori, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 29, 1984, Ser. No. 594,661
Claims priority, application Japan, Mar. 29, 1983, 58-51503
Int. Cl.[4] H04N *5/50*; H04B *11/32, 11/16*
U.S. Cl. 358—191.1 **8 Claims**

1. A method for tuning a receiver having means for producing a down signal when a tuning frequency is below a predetermined frequency band around the actual frequency of a received signal and an up signal when said tuning frequency is above said predetermined frequency band around said actual frequency, comprising the steps of:

incrementing a local oscillator frequency of said receiver in steps of a first predetermined frequency interval beginning with a frequency lower by a predetermined frequency than a center frequency of said local oscillator;

after the occurrence of both said up signal and said down signal, decrementing said local oscillator frequency by a second predetermined frequency interval and then incrementing said local oscillator frequency in steps of a third predetermined frequency interval smaller than said first frequency interval until a frequency is reached at which both said up signal and said down signal are lost;



alternately increasing and decreasing said local oscillator frequency by a fourth predetermined frequency interval; and

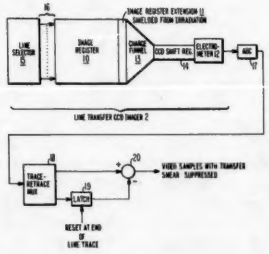
if said up signal and said down signal are respectively present and not present upon increasing said local oscillator frequency by said fourth predetermined frequency interval and respectively not present and present upon decreasing said local oscillator frequency by said fourth predetermined frequency interval, employing said frequency at which both said up and down signals are lost as a receiving frequency.

4,594,612

TRANSFER SMEAR REDUCTION IN LINE TRANSFER CCD IMAGERS

Peter A. Levine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 10, 1985, Ser. No. 690,249
Int. Cl.[4] H01N *3/15*
U.S. Cl. 358—213 **6 Claims**



1. In combination:

a CCD imager of line transfer type for supplying samples of video signal contaminated with transfer smear and for supplying samples of transfer smear alone; and

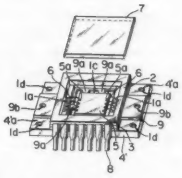
means differentially combining samples of video signal contaminated with transfer smear with samples of transfer smear alone for generating video signal samples in which transfer smear contamination is substantially suppressed.

4,594,613

SOLID-STATE IMAGING DEVICE ASSEMBLY

Kenichi Shinbori, and Kazuo Ishikawa, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1983, Ser. No. 464,576
Claims priority, application Japan, Feb. 16, 1982, 57-23171
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213 **19 Claims**



1. A solid-state image pick-up device assembly comprising:

(a) a solid-state image pick-up device;

(b) a metal member provided with first position defining means for defining a first position of said slid-state image pick-up device and second position defining means for defining a second position of said assembly on an instrument utilizing said assembly, said second position defining means having a predetermined fixed relation to said first position; and

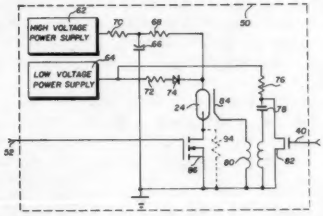
(c) an insulating frame for sealing said solid-state image pick-up device together with said metal member.

4,594,614

FILM VIDEO PLAYER WITH ELECTRONIC STROBE LIGHT

Lee F. Frank, Rochester, N.Y., and Donald F. Kaiser, Parsippany, N.J., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 4, 1984, Ser. No. 596,868
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—214 **4 Claims**



1. A film video player for producing a standard television signal from color negative photographic film, comprising:

an area array image sensor for sensing a flash illuminated image of the photographic film during a vertical retrace interval to produce the standard television signal;

an electronic strobe light for flash illuminating the photographic film to produce the flash illuminated image, the electronic strobe light including an elongated flash tube and an elongated trigger electrode extending along the length of the flash tube;

means for dispersing the light from the flash tube for producing more uniform illumination;

a high voltage power supply for providing a voltage greater

than the minimum ignition voltage of the flash tube for igniting an arc in the flash tube, and a low voltage power supply for providing a voltage less than the minimum ignition voltage for producing an extended pulse of light of constant intensity from the flash tube; and

flash control means for controlling the flash-to-flash light output variations to less than 0.02 stops standard deviation to thereby eliminate flicker in the television signal, including;

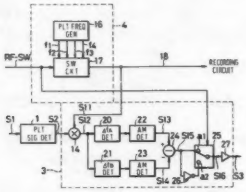
photosensing means including a photodiode and operational amplifier means for sensing the light output of said flash tube and producing a control signal in response to a predetermined quantity of light being produced, said photodiode being located to sense the dispersed light produced by said light dispersing means, and

solid state switch means comprising a power FET in series with the flash tube, and responsive to said control signal for interrupting the current through said flash tube in response to said control signal.

4,594,615
STILL IMAGE REPRODUCING APPARATUS

Shoji Nemoto, and Hiroshi Yoshioka, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 526,063
Claims priority, application Japan, Aug. 31, 1982, 57-151206
Int. Cl.[4] G11B *21/10*
U.S. Cl. 360—10.2 **13 Claims**



1. Apparatus for use in reproducing a still picture from information signals recorded in a series of oblique tracks arranged adjacent each other on a magnetic record medium, said tracks having also recorded therein pilot signals of mutually different frequencies changing cyclically from track to track, comprising:

magnetic head means for reproducing signals recorded in said tracks on said magnetic record mediums;

pilot signal detecting means for producing a detected pilot signal from said signals reproduced by said magnetic head means;

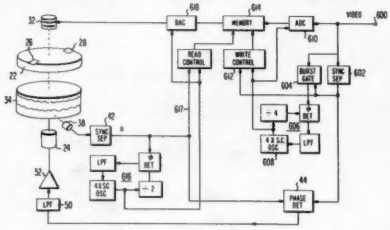
tracking signal generator means producing a reference pilot signal having a cyclically changing frequency equal at any time to one of said mutually different frequencies of said pilot signals; and

error signal generator means receiving said detected pilot signal and said reference pilot signal for producing therefrom a control signal representing relative displacement of said reproducing head from the track being reproduced, said error signal generator means including a signal multiplier for multiplying said detected pilot signal with said reference pilot signal and producing a multiplication output signal including a difference between a frequency component included in said detected pilot signal and a frequency of said reference pilot signal when said head is not aligned with said track being reproduced.

4,594,616
RECORDING OF TIMING SIGNALS SYNCHRONOUS WITH A ROTARY RECORDER MEMBER

Robert A. Dischert, Burlington, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 216,170, Dec. 15, 1980, abandoned.
This application Jan. 18, 1984, Ser. No. 571,155
Int. Cl.[4] H04N *5/91, 9/79*; G11B *15/00*
U.S. Cl. 360—36.1 **12 Claims**



1. A television camera-recorder arrangement for recording television signals of an image from a camera tube onto an elongated recording medium for use in an environment where the recorder may be subject to motion, the arrangement comprising:

controllable ramp signal generating means;

deflection means coupled to said camera tube and to said ramp signal generating means for scanning said camera tube in response to said ramp signal, said ramp signal having an amplitude representing an extreme of said scanning;

means coupled to said camera tube for generating said television signals representative of the image, including recurrent timing portions generated at the rate of said ramp signal;

transducing means coupled to said camera tube for transducing said television signals to the elongated medium;

a source of reference signals having a predetermined frequency characteristic;

rotatable means responsive to said source of reference signals for providing stable long-term relative motion between said medium and said transducing means, said rotatable means being subject to acceleration due to recorder motion, thereby causing short-term variations in the rotational velocity of said rotatable means, whereby said timing portions may not be transduced to regualr positions on said medium;

speed indicating means coupled to said rotatable means for generating signals indicative of the rate of rotation of said rotatable means;

first control means coupled to said ramp signal generating means and to said speed indicating means for causing the rate of recurrence of said scanning to vary in response to said rate of rotation, thereby causing said recurrent timing portions to be regularly placed on said recording medium, whereby the interval between said recurrent timing portions changes in response to said short-term variations, tending to produce concurrent amplitude changes in said ramp signal which may cause apparent variations in the size of the image displayed from the record; and

amplitude control means coupled to said ramp signal generating means for controlling the slope of said ramp signal in response to said signals indicative of the rate of rotation of said rotatable means for maintaining said amplitude of said ramp signal substantially unchanged, thereby reducing said apparent variations in the size of the image.

4,594,617
METHOD AND APPARATUS FOR CLEANING A RECORDING AND/OR REPRODUCING HEAD

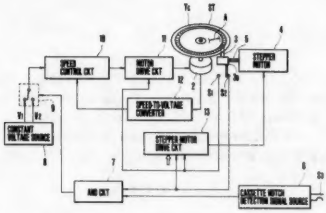
Nobuo Tezuka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1983, Ser. No. 522,045

Claims priority, application Japan, Aug. 11, 1982, 57-139388; Jan. 27, 1983, 58-11688; Feb. 2, 1983, 58-15823; Feb. 3, 1983, 58-16798

Int. Cl.⁴ G11B *5/41*

U.S. Cl. 360—73 **27 Claims**



1. A method of cleaning a magnetic head, said head being adapted for recording signals on a flexible magnetic recording medium and/or reproducing the signals from the recording medium when the head and the medium are relatively moved at a predetermined first relative speed to form an air spacing therebetween, said method comprising the steps of:

(A) facing said head with a head cleaning member which is flexible; and

(B) relatively moving said head and said cleaning member at a second relative speed lower than said first relative speed so that the head and the cleaning member are substantially in contact with each other.

4,594,618
INFORMATION REPRODUCING APPARATUS

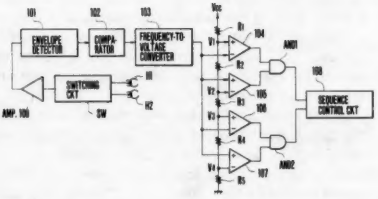
Susumu Kozuki, Tokyo; Hiroyuki Takimoto, Kanagawa; Hiroo Edakubo, Tokyo, and Nobutoshi Takayama, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,663

Claims priority, application Japan, Dec. 24, 1982, 57-230445; Feb. 2, 1983, 58-15581

Int. Cl.⁴ G11B *15/52*

U.S. Cl. 360—73 **18 Claims**



1. A reproducing apparatus comprising:

(a) transporting means for selectively transporting a tape-shaped recording medium at one of at least two different running speeds for reproducing purposes;

(b) reproducing means for reproducing information recorded on said tape-shaped recording medium as it is transported by said transporting means; and

(c) discriminating means for determining whether or not the transportation speed of said transporting means is coincident with the recording speed of the information recorded on said tape-shaped recording medium,

said discriminating means including envelope detector means for detecting an envelope of the reproduced output of said reproducing means.

4,594,619
MAGNETIC REPRODUCE APPARATUS WITH MAGNETORESISTIVE HEAD

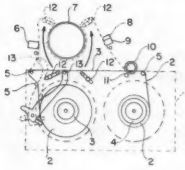
Masaya Hijikigawa, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 358,633, Mar. 16, 1982, Pat. No. 4,405,958, which is a continuation of Ser. No. 116,890, Jan. 30, 1980, abandoned. This application May 23, 1983, Ser. No. 497,209

Claims priority, application Japan, Jul. 19, 1979, 54-100482[U]

Int. Cl.⁴ G11B *5/12*

U.S. Cl. 360—74.4 **2 Claims**



1. A magnetic-record reproduction system for selectively reproducing magnetic information signals recorded on a magnetic tape as a plurality of programs, each said program being separated from others on said tape by cue signals, comprising:

head means for reproducing said magnetic information signals recorded on said tape;

transport means for moving said tape across said head means, said transport means including,

tensioning means for maintaining said tape in tension as it is moved across said head means, said tensioning means including a movable tension arm contacting said tape; and

detector means mounted to said tension arm for sensing said cue signals to enable selection of said program thereby, said detector means including a magnetoresistive element;

said tension arm including,

a cavity formed in said tension arm and receiving said magnetoresistive element, and a non-magnetic metallic film mounted on the surface of said tension arm and providing abrasion-resistance to said tension arm as it contacts said magnetic tape.

4,594,620
DISK STORAGE FILE WITH A FOUR PHASE, SINGLE PHASE DRIVE STEPPING MOTOR

Makoto Shoji, Fussa, and Yoshiaki Sakai, Higashikurume, both of Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,677

Claims priority, application Japan, Apr. 1, 1983, 58-56892

Int. Cl.⁴ G11B *5/54*

U.S. Cl. 360—75 **7 Claims**

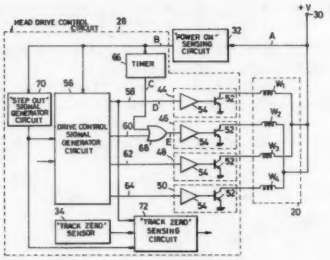
1. A storage file for use with a disklike record medium, comprising:

(a) a rotary drive mechanism for imparting rotation to the record medium;

(b) a transducer head for data transfer with the record medium;

(c) a radial drive mechanism comprising a four phase stepping motor for moving the transducer head radially with respect to the record medium, the stepping motor having a rotor and a plurality of sets of first, second, third and fourth phase windings arranged sequentially in the order named; and

(d) control circuit means for normally energizing the windings of the stepping motor in a single phase drive mode to cause rotation of the rotor thereof in discrete increments, the control circuit means being adapted to energize at least one of the second, third and fourth phase windings in each set for a preassigned length of time when the storage



file is electrically turned on and to start energizing the first phase windings by the end of the preassigned length of time

so as to turn the rotor of the stepping motor from a possible alignment with the third phase winding in any set when the storage file is turned on and into alignment with a first phase winding.

4,594,621

ROTARY HEAD TYPE DIGITAL INFORMATION SIGNAL RECORDING AND REPRODUCING APPARATUS AND TRACKING CONTROL METHOD THEREIN

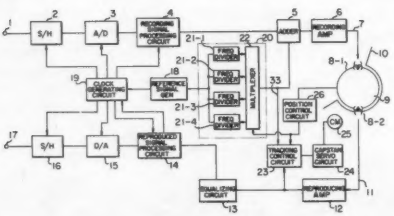
Takaharu Noguchi; Shigeru Yamazaki, and Takao Arai, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1984, Ser. No. 649,654

Claims priority, application Japan, Sep. 14, 1983, 58-168157

Int. Cl.[4] G11B *5/52, 5/56*

U.S. Cl. 360—77 **7 Claims**



1. A rotary head type PCM digital signal recording and reproducing apparatus, comprising:

an analogue-to-digital converter for converting an analogue signal to a PCM digital data signal;

a recording signal processing circuit for performing predetermined processings and time base compression on the output signal of said A/D converter;

a rotary drum having recording/reproducing heads securely mounted thereon for recording and reproducing the output of said recording signal processing circuit on and from a recording medium;

a reproduced signal processing circuit for performing predetermined processings and time base expansion on the PCM digital signal reproduced upon reproduction;

a digital-to-analogue converter for converting the output signal of said reproduced signal processing circuit into an analogue signal;

a tracking signal generating circuit for generating a tracking signal to be utilized for automatically tracking the recording track upon reproduction; and

a recording control circuit for controlling the timing at which the output signal of said tracking signal generating circuit is recorded on the recording track, wherein said tracking signal is recorded at least at a location separated from a region in which said PCM digital data signal converted from the analogue signal is recorded.

4,594,622

TRACK FOLLOWING SERVO SYSTEM FOR A DISK FILE

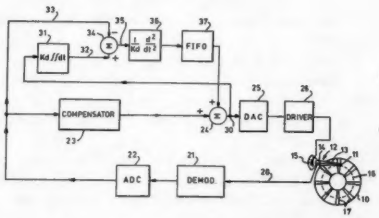
Christopher N. Wallis, Eastleigh, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1984, Ser. No. 606,009

Claims priority, application European Pat. Off., Jun. 30, 1983, 83303793.0

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—77 **7 Claims**



1. A track following servo system for a disk file in which information is recorded in nominally concentric circular data tracks on a rotatable disk record, the system comprising:

position reference information for each of the data tracks, said position reference information being located on the same or on an associated disk record;

a transducing head for reading said position reference information during rotation of the disk;

a demodulator for producing from the position reference information read back by the head, a position error signal which is representative of the deviation of the head from a selected one of the data tracks;

an actuator responsive to an electrical input signal to move the head across the disk during accessing of different data tracks, and to cause the head to follow a selected one of the data tracks in response to the position error signal;

a feedback path connecting the demodulator output to the input to the actuator;

means for providing an actuator motion indication signal, the actuator motion indication signal being derived from the electrical input signal to the actuator;

means operative during data track following for deriving a signal related to the eccentricity of the tracks, said eccentricity signal deriving means further comprising means for combining a function of said actuator motion indication signal and a function of said position error signal during at least one revolution of the disk;

storage means for storing the eccentricity related signal; and

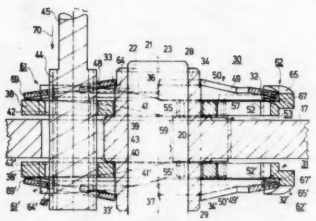
a feedforward path connecting the storage means output to the input to the actuator, whereby the actuator input signal for data track following is a combination of the generally instantaneous position error signal on siad feedback path and said previously stored eccentricity related signal on said feedforward path.

4,594,623

ROTARY SCANNING TAPE RECORDER WITH IMPROVED HEAD DRUM CLAMPING

Heinrich Hütter, Tulln, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 26, 1984, Ser. No. 675,055
Claims priority, application Austria, Mar. 6, 1984, 752/84
Int. Cl.[4] G11B *5/027*
U.S. Cl. 360—84 29 Claims



1. A rotary scanning magnetic tape recorder, comprising at least one rotatable magnetic head which scans a magnetic tape along information tracks,

a rotatable shaft,

a support on which the head is mounted, said support comprising a hub by which the support is mounted on said shaft, and at least one hollow cylindrical portion which is coaxial with the shaft and which projects axially from the hub, and

a releasable clamping device for clamping said portion onto said shaft, said device comprising

an axially adjustable clamping ring disposed coaxially with the shaft, said ring comprising at least three clamping projections inclined equally and arranged axially symmetrically relative to the shaft, which projections project radially towards the shaft and act on said cylindrical portion, and

a rotatable adjusting ring for adjusting the clamping ring, said adjusting ring cooperating with said clamping projections to clamp the cylindrical portion onto the shaft upon rotation of the adjusting ring with respect to the support,

characterized in that, on a side remote from the clamping ring, the adjusting ring bears on the support axially symmetrically relative to the shaft,

the clamping device includes means for rotating the adjusting ring with respect to the support, said means including an axially symmetrical arrangement of gear segments and bores, said gear segments being coaxial with said shaft, said gear segments and bores being arranged to be engageable by a rotatable pinion inserted through one of said bores and meshing with one of said gear segments to rotate the gear segment in response to rotation of the pinion,

the device further includes at least three cam-and-follower arrangements for adjusting the clamping ring at locations respectively related to said clamping ring projections as a result of rotation of the adjusting ring, said arrangements being arranged axially symmetrically relative to the shaft, and

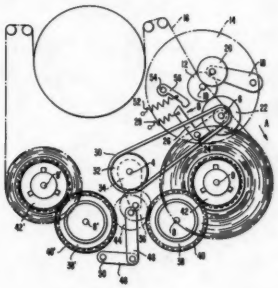
each of said arrangements comprises a cam surface on one of said rings, and a cam follower arranged on the other of said rings for cooperation with said cam surface.

4,594,624

MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS WITH VARIABLE CAPSTAN TORQUE TRANSMISSION MEANS

Hiroshi Kanchiku; Jiro Kajino, both of Neyagawa, and Fuminari Saito, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 7, 1982, Ser. No. 447,619
Claims priority, application Japan, Dec. 9, 1981, 56-199265; Dec. 18, 1981, 56-205475; Jan. 7, 1982, 57-1457
Int. Cl.[4] G11B *5/016, 5/027, 5/008, 17/00*
U.S. Cl. 360—90 3 Claims



1. A magnetic tape recording and/or reproducing apparatus comprising:

a motor;

a capstan shaft rotated by said motor;

a pinch roller for pressing a magnetic tape against said capstan shaft for causing said capstan to transport the magnetic tape at constant speed;

a driving roller mounted coaxially with said capstan shaft and rotatable with said capstan shaft;

an idler means pressed against said driving roller in frictionally engaging relationship with said driving roller for transmitting a rotational force from said driving roller to said idler means;

a pair of reel drive turntables;

a transmissin means for transmitting rotation of said idler means to each of said pair of reel drive turntables for taking-up thereon said magnetic tape, said transmission means comprising a relay element rotatably drivingly interconnected with said idler means and being rotated by said idler means and a transmitting means connected to said relay element for selectively transmitting rotation of said relay element to one of said pair of reel drive turntables;

a pressing means connected with said idler means and generating a pressure force for pressing said idler means against said driving roller; and

a pressure force changing means engageable with said pressing means for changing said pressure force generated by said pressing means to change said rotational force from said driving roller to said idler means selectively according to the operating mode of said apparatus.

4,594,625

TAPE RECORDER

Takamasa Kurafuzi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 27, 1983, Ser. No. 499,144
Claims priority, application Japan, Jun. 4, 1982, 57-96023
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—96.3 11 Claims

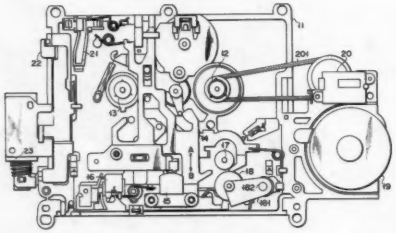
1. A tape recorder comprising:

a motor;

reel tables on which reel hubs with a tape wound thereon are mounted;

first operating members for driving the tape at a low speed and second operating members for driving the tape at a high speed;

a high-speed drive mechanism interlocking with said second operating members, said high-speed drive mechanism being adapted to be held in a first state during an operating state of said second operating members so as to transmit a rotational force of said motor to said reel tables, and being adapted to be held in a second state during a nonoperating state of said second operating members so as not to transmit the rotational force of said motor to said reel tables;



a low-speed drive mechanism interlocking with said first operating members, said low-speed driving mechanism being brought to an operating state by the rotational force of said motor so as to transmit the rotational force thereof to said reel tables, thereby driving the tape at the low speed; and

a control mechanism for holding said high-speed drive mechanism in the second state while said low-speed drive mechanism changes from a nonoperating state to the operating state;

whereby a load imposed on said motor is decreased when said first operating members, are operated while the tape is driven at the high speed.

4,594,626

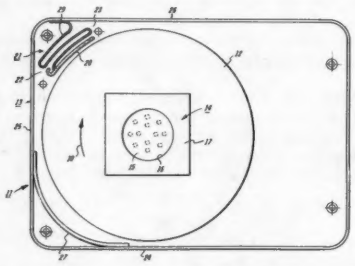
AIR FILTRATION SYSTEM FOR ROTATING DISK DRIVES HAVING RECIRCULATING AIR FLOWS

Thomas P. Frangesh, Campbell, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 13, 1984, Ser. No. 579,313

Int. Cl.[4] G11B *5/012, 15/64, 17/32*

U.S. Cl. 360—97 **8 Claims**



1. In a rotating disk memory having a pass-through air filtration system for removing particulates from a recirculating air flow, the improvement characterized by said air filtration system including a bipolar electrostatic filtering medium having a 0.3 micron filtering efficiency no greater than approximately 80%.

4,594,627

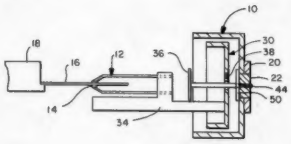
SAFETY LATCH FOR PICKUP HEADS AND CARRIAGE DISC DRIVE

Stephen R. Viskochil, San Jose, and Brian H. Simons, Oakland, both of Calif., assignors to Priam Corporation, San Jose, Calif.

Filed Jun. 28, 1983, Ser. No. 508,806

Int. Cl.[4] G11B *5/54, 21/22, 5/48;* **H02K** *00/00;* **G11B** *5/48*

U.S. Cl. 360—105 **3 Claims**



1. A disc drive comprising

a housing,

a magnetic disc rotatably mounted in said housing,

a linear motor including a bobbin within said housing,

a pickup head carriage assembly driven by said bobbin between an inward and an outward limit,

a limit stop assembly for limiting travel of said bobbin and pickup head carriage assembly, and

a magnet mounted on said bobbin for magnetically engaging said limit stop assembly at the inward limit of travel of said bobbin and pickup head carriage assembly and yieldably maintaining said bobbin and pickup head carriage assembly at the inward limit of travel.

4,594,628

MAGNETIC HEAD HAVING COBALT-CONTAINING ZINC-FERROUS FERRITE CORE

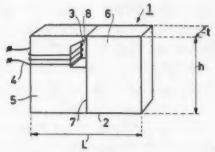
Doeko Stoppels; Peter G. T. Boonen; Ulrich E. Enz, and Leonardus A. H. van Hoof, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 14, 1983, Ser. No. 458,125

Claims priority, application Netherlands, Jan. 19, 1982, 8200174

Int. Cl.[4] G11B *5/127*

U.S. Cl. 360—125 **6 Claims**

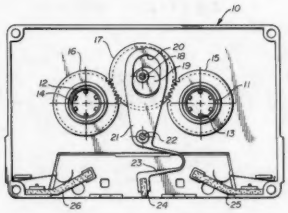


1. A magnetic head comprising a magnetic core which includes two core parts forming a transducing gap, characterized in that each core part consists essentially of a cobalt-containing zinc-ferrous ferrite having a Co^{II} content in a range from 0.05% to 0.5% of the total metal ion concentration.

4,594,629
CASSETTE CLEANING DEVICE

Stephane M. d'Alayer de Costemore d'Arc, Ways, Belgium, assignor to Allsop, Inc., Bellingham, Wash.

Continuation of Ser. No. 312,370, Oct. 16, 1981, Pat. No. 4,442,468. This application Apr. 5, 1984, Ser. No. 597,403
Claims priority, application Belgium, Oct. 24, 1980, 885,871
The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.
Int. Cl.[4] G11B 5/41
U.S. Cl. 360—128 **61 Claims**



1. A cleaning device for cleaning a head of a tape cassette player, where said player has a cassette receiving area to receive a tape cassette in a playing position, and a pair of spaced spindles to engage first and second spools of said tape cassette, which spindles are at predetermined spindle locations in said cassette receiving area, said device comprising:

a. a cassette housing adapted to be inserted in said cassette receiving area in an operating location;

b. a drive system comprising:

1. a first drive member rotatably mounted in said cassette housing at a first drive location where, with said housing in its operating position, said first drive member engages said first spindle in drive relationship so as to be rotatable with said first spindle;

2. a second drive member rotatably mounted in said cassette housing at a second drive location where, with the housing in its operating position, said second drive member engages said second spindle in drive relationship so as to be rotatable with said second spindle;

3. an interconnecting drive means operatively engaging said first and second drive members in a manner that rotational movement of one of said first and second drive members causes the other of said first and second drive members to rotate;

c. a cleaning member having a cleaning portion positioned to engage the head of the player, said cleaning member being mounted in said housing to be driven on a cleaning path by which said cleaning portion wipes against the head of the player;

d. said first and second drive members being first and second wheel members, respectively, and said interconnecting drive means is a third wheel member operatively engaging said first and second wheel members;

whereby when either spindle of the player is rotated under power from the player, the drive member engaging that spindle is caused to rotate to insure that the other of the spindles is rotating, and the cleaning member is caused to move in a path to clean the head of the player.

17. A cleaning device for cleaning a head of a tape cassette playing and/or recording machine, where the machine has a cassette receiving area to receive a tape cassette in a playing position, first and second spaced spindles, and a capstan and pinch roller which cooperate with one another to move a playing and/or recording tape through said machine on a tape path passing adjacent said head and between said capstan and said pinch roller, said device comprising:

a cassette housing adapted to be inserted in said cassette receiving area in an operating location;

b. a drive system mounted in said cassette housing to drivingly interconnect said spindles, said drive system comprising:

1. a first hub member rotatably positioned in said cassette housing to engage said first spindle so as to be rotatable therewith;

2. a second hub member rotatably positioned in said cassette housing to engage said second spindle so as to be rotatable therewith; and

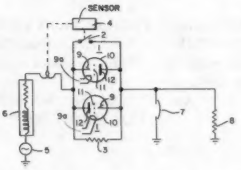
3. an interconnecting drive means positioned in said cassette housing and operatively engaging said two hub members in a manner that rotation of one of said hub members causes rotation of the other of said hub members; and

c. said device further comprising in addition to said drive system a cleaning member having cleaning portion for cleaning said head, said cleaning member being positioned in said device to be driven on a cleaning path other than said tape path, means to move said cleaning member on said cleaning path in response to rotation of at least one of said spindles to impart a cleaning motion to said cleaning portion.

4,594,630
EMISSION CONTROLLED CURRENT LIMITER FOR USE IN ELECTRIC POWER TRANSMISSION AND DISTRIBUTION

Mario Rabinowitz, Redwood City, and Walter H. Esselman, Los Altos, both of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 2, 1980, Ser. No. 155,487
Int. Cl.[4] H02H 3/00
U.S. Cl. 361—13 **10 Claims**



1. For use in limiting fault currents in electrical power transmission and distribution lines, a fault current limiting circuit comprising a first emission limited device having a cathode element, an anode element, and means for effecting the emission of current carriers from said cathode whereby current carrier emission is limited above the current level established by said means for effecting the emission; a second emission limited device having a cathode element, an anode element, and means for effecting the emission of current carriers from said cathode whereby current carrier emission is limited above the current level established by said means for effecting the emission; and means connecting said first emission limited device and said second emission limited device in parallel and in opposite polarity.

4,594,631
TEMPERATURE PROTECTIVE CIRCUIT FOR A CHARGING GENERATOR

Yoshiyuki Iwaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,785
Claims priority, application Japan, Jun. 28, 1983, 58-101879; Jun. 28, 1983, 58-101880; Jun. 28, 1983, 58-101881
Int. Cl.[4] H02H 7/06
U.S. Cl. 361—20 **4 Claims**

1. A charging generator system comprising:

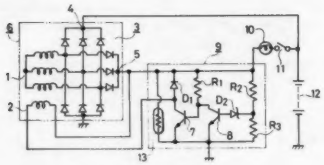
a charging generator having field and armature coils;

rectifier means for rectifying AC outputs induced in said armature coils of said charging generator, said rectifier means having first and second rectifier output terminals

and a ground terminal, a first terminal of said field coil being coupled to said second rectifier output terminal;

a battery coupled directly to said first rectifier output terminal and also coupled through a keyswitch and charge display lamp to said second rectifier output terminal;

voltage regulator means comprising a switching transistor coupled between a second terminal of said field coil and said ground terminal, said voltage regulator means selectively driving said switching transistor to thereby control



current flow in said field coil to maintain an output voltage of said charging generator at a predetermined value; and

protective shorting circuit means coupled between said second rectifier output terminal and said ground terminal, said protective shorting circuit means having a high resistance under normal temperatures and a low resistance under high temperatures to thereby interrupt said current flow in said field coil under said high temperatures.

4,594,632

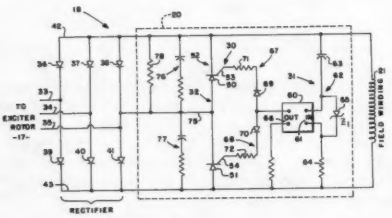
OVERVOLTAGE PROTECTION CIRCUIT FOR SYNCHRONOUS MACHINEROTOR

Lewis E. Unnewehr, Lima, Ohio, assignor to Lima Electric Co., Inc., Lima, Ohio

Filed Apr. 20, 1984, Ser. No. 602,349

Int. Cl.⁴ H02H *7/09*

U.S. Cl. 361—33 **32 Claims**



1. A brushless synchronous machine, comprising

an exciter stator, an alternator stator, an exciter rotor and an alternator rotor, said rotors being rotatably relative to said stators, and an overvoltage protection circuit for the rotor of such machine, including voltage level sensing means for sensing the magnitude of at least one polarity of an AC signal in such rotor, triggerable signal conducting means operable in a protecting mode to protect at least a portion of such rotor from a signal of excessive magnitude in response to sensing of such excessive magnitude by said voltage level sensing means, said triggerable signal conducting means also having a stand-by mode for not affecting operation of such rotor and being automatically capable of resetting from protecting mode to stand-by mode, said voltage level sensing means comprising a solid state relay, a resistor and capacitor input circuit means for determining the excessive voltage level required to effect operation of said solid state relay to cause said triggerable signal conducting means to operate in such protecting mode, and polarity sensitive means coupled in said input circuit means for allowing said solid state relay to sense the magnitude of only one polarity of such AC signal and for limiting the maximum voltage of such AC signal applied to said solid state relay.

4,594,633

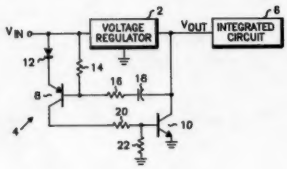
INTEGRATED CIRCUIT PROTECTION CIRCUIT

Greg M. Townsend, Palatine, and James A. Henderson, Jr., Streamwood, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 7, 1983, Ser. No. 511,684

Int. Cl.⁴ H02H *9/02*

U.S. Cl. 361—57 **19 Claims**



1. A protection device for an externally coupled integrated circuit having a first and second DC input terminal, comprising:

detecting means, operatively DC coupled to said integrated circuit at said DC input terminals, for detecting a "latch-up" condition in said integrated circuit;

switch means for effecting a low impedance across said DC input terminals; and

clearing means operatively coupled to said detecting means and said switch means, for automatically clearing said integrated circuit of said "latch-up" condition for a predetermined period of time.

4,594,634

HIGH-VOLTAGE DIRECT-CURRENT SUPPLY WITH OVER-CURRENT PROTECTION

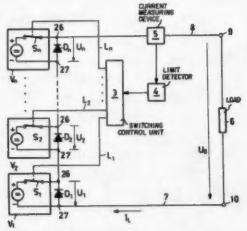
Wolfram Schminke, Laufenburg, Fed. Rep. of Germany, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Jul. 24, 1984, Ser. No. 633,926

Claims priority, application Switzerland, Sep. 8, 1983, 4902/83

Int. Cl.⁴ H02H *3/08*

U.S. Cl. 361—93 **8 Claims**



1. A high-voltage direct-current supply system with over-current protection, comprising:

a high-voltage source having an output voltage and comprising a plurality of medium-high voltage sources each having output terminals at which is supplied a medium-high voltage, the output terminals of the medium-high sources connected in series so as to sum the medium-high voltages to form the output voltage based on the sum, each of the

medium-high voltage sources including at least one thyristor switching element for rapidly switching off the associated medium-high voltage source, and a reverse-biased no-load diode connecting the output terminals of each medium-high voltage source;

a current-measuring device for measuring a load current which flows through a load connected to the high-voltage source;

a limit detector for detecting when a predetermined limit of load current is exceeded;

a switch control unit connected to said limit detector and to said switching elements via respective control lines for simultaneously applying control signals to said switching elements via said control lines such that at least one of said switching elements interrupts load current through the respective medium-high voltage source when said predetermined limit is exceeded;

wherein plural of the medium-high voltage sources each supply the same medium-high voltage and the remaining medium-high voltage sources supply a respective output voltage equal to the 2^m the part of said medium-high voltage, where $m=1, 2, \ldots$;

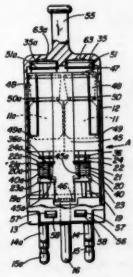
each medium-high voltage source comprising a current-measuring device and a limit detector such that the respective medium-high voltage source is turned off also if the current supplied by said respective medium-high voltage source exceeds a predetermined limit.

4,594,635

OVERLOAD PROTECTOR FOR COMMUNICATION SYSTEMS

Eric A. Scheithauer, Chicago, and Donald F. Jaycox, Deerfield, both of Ill., assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 23, 1984, Ser. No. 643,406
Int. Cl.[4] H02H 9/06
U.S. Cl. 361—119 **15 Claims**



1. An overload protector assembly for telecommunications systems, including an elongate housing of insulating material, said housing having a closed outer end and an open inner end, and a base attached to said inner end, a pair of line terminals in said base and a ground terminal in said base;

a line bracket extending in said housing along one side thereof and attached at an inner end to one of said line terminals;

a ground bracket extending in said housing along another side thereof and attached at an inner end to said ground terminal;

an overvoltage protector unit positioned at an intermediate position in said housing and including opposed electrodes spaced apart along the house to define an arc gap;

circuit means connecting an inner one of said electrodes to the other of said line terminals;

a first extension on said line bracket connected to said circuit means to provide a line circuit between said line terminals;

a second extension on said line bracket extending across said housing at said outer end;

a flange at an outer end of said ground bracket extending across said housing at a position between said second extension on said line bracket and an outer one of said electrodes;

a compression spring between said flange and said outer one of said electrodes;

a normally non-conductive structural separating member in contact with said flange and said second extension wherein a portion of said normally non-conductive structural separating member is positioned directly below said second extension and sid portion is directly above said flange; and

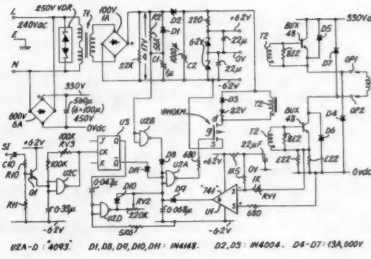
an aperture in said outer end of said housing to permit electrical connection to said second extension of said line bracket.

4,594,636

REACTIVE LOAD DRIVE AND SURGE PROTECTION

Arthur Hamer, Oldham, and Beverley H. Pardoe, Manchester, both of England, assignors to National Research Development Corporation, London, England

Filed Sep. 21, 1983, Ser. No. 534,242
Claims priority, application United Kingdom, Sep. 21, 1982, 8226867
Int. Cl.[4] H01H 47/32
U.S. Cl. 361—152 **9 Claims**



1. An electrical drive circuit arrangement to control the energisation of a reactive load with a high alternating voltage including

a control stage to generate an alternating control signal and apply it to an output of the control stage,

an electrically isolating control signal transfer means having an input connected to the output of the control stage to transfer the control signal to an output of the transfer means while isolating the output from the control stage,

an output stage including power control semiconductor devices and having a control input connected to the output of the transfer means, an energisation input for a high voltage electrical supply in excess of 300 volts d.c. and an output for the connection of a said reactive load to which in operation the output stage applies said high voltage alternating energisation in dependence on the control signal, the high voltage being prevented from reaching the control stage via the input of the output stage by the isolating transfer means,

said control stage further including means to provide circuit condition signals and a noise-resistant guard means responsive to said signals to permit generation of the control signal only when said condition signals have selected values, the transfer means further including means to restrict the signal to the input to the output stage to the control signal permitted by the guard means, and the output stage including means to generate a protection signal on the occurrence of a current surge through said devices in the high voltage energisation of a connected

reactive load, the protection signal being constrained to a potential low enough for direct application to the control stage without the need for isolating transfer to protect against high voltage in the control stage and the control state including means responsive to surge protection signal to act on the control signal and remove any energisation of the load by the output stage to protect the stage.

4,594,637

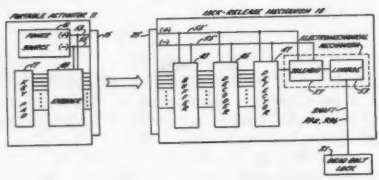
DIGITAL ELECTRONIC LOCK SYSTEM

Sidney Falk, 3000 N. River Rd., River Grove, Ill. 60171

Filed Feb. 21, 1985, Ser. No. 703,813

Int. Cl.[4] H01H *47/00*

U.S. Cl. 361—172 **12 Claims**



9. An apparatus for electronically controlling the activation of a lock-release mechanism, said apparatus comprising:

a small, lightweight portable housing capable of being easily carried;

an input means associated with said housing for converting instructions initiated by an operator of said apparatus into electrical signals;

an energization source within said housing for powering said input means, said energization source having at least two terminals;

a first connector integral with said housing and providing output ports for the electrical signals of said input means and the terminals of said energization source;

a lock-release mechanism and a lock associated therewith mounted to a stationary fixture;

a second connector for electronically mating with said first connector, said second connector being integrally mounted with said lock-release mechanism;

an electronic decoder and detector means in said lock-release mechanism for receiving said electrical signals from said input means and for receiving power from said energization source when said first and second connectors are joined; and

said electronic decoder and detector means being responsive to a predetermined coded signal to transfer power from said energization source to said lock-release mechanism thereby releasing the lock associated with said lock-release mechanism.

4,594,638

LIQUID LEAK SENSOR

Hirosuke Suzuki, Tokorozawa; Satoru Kobayashi, and Katsuo Shimosawa, both of Hitaka, all of Japan, assignors to Junkosha Co. Ltd., Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,541

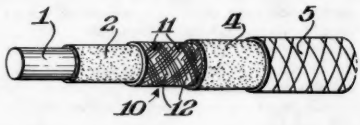
Claims priority, application Japan, Nov. 18, 1983, 58-178857[U]

Int. Cl.[4] H01G *7/00*; H02G *15/28*

U.S. Cl. 361—280 **8 Claims**

1. An improved liquid leakage sensor comprising at least two electrical conductors in substantially parallel relationship with each other and having a detector layer between said conductors and adjacent to both, the permittivity of said detector layer being measurably changed by the entry of said liquid into said detector layer, at least one of said conductors being permeable to said liquid, the improvement comprising said permeable conductor constructed of at least one electrical conducting member and at least one member which enhances passage of said liquid through said permeable conductor,

wherein said permeable conductor is a braided construction



braided over said detector layer in coaxial construction with respect to the other conductor, and

wherein said braided construction is a mixed braid of metallic wires and porous plastic strands.

4,594,639

CAPACITIVE PRESSURE DETECTOR

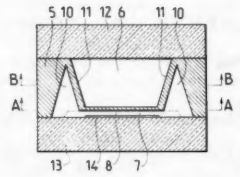
Heikki T. Kuisma, Helsinki, Finland, assignor to Vaisala Oy, Helsinki, Finland

Filed Feb. 15, 1985, Ser. No. 701,870

Claims priority, application Finland, Feb. 21, 1984, 840700

Int. Cl.[4] H01G *7/00*; G01L *9/12*

U.S. Cl. 361—283 **6 Claims**



1. A capacitive pressure detector comprising:

a plate-shaped base,

a stationary capacitor plate disposed on the base,

a plate-shaped cover disposed at a distance from the base,

a silicon plate disposed between the base and the cover and comprising a membrane-like middle portion with an edge area, an edge portion surrounding the middle portion, and a relatively thin-walled collar portion extending from the edge area of the middle portion to the edge portion, thus defining an aneroid capsule between the cover and the middle portion, said middle portion functioning as a mobile capacitor plate, the distance of which from the stationary capacitor plate changes by the effect of the pressure within the aneroid capsule, the edge portion and the collar portion defining between themselves a groove surrounding a basin and having a substantially V-shaped cross-section.

4,594,640

VARIABLE CAPACITOR

Tetsuo Tatsumi, 307 Shinshimoemori-cho, Fukui-shi, Fukui-ken, Japan

Filed Aug. 30, 1984, Ser. No. 645,752

Claims priority, application Japan, Mar. 27, 1984, 59-44664[U]

Int. Cl.[4] H01G *5/06*

U.S. Cl. 361—293 **11 Claims**

1. A variable capacitor comprising:

an insulating case provided with at least one opening;

a dielectric plate arranged within said insulating case;

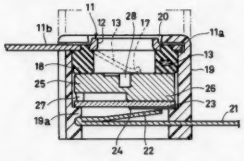
first and second electrodes arranged within said insulating

case to be opposed to each other through said dielectric plate;

a metal rotor rotatably arranged within said insulating case and provided with said first electrode in its one surface, with the other surface thereof being directed toward said opening;

a formation means provided in said other surface of said metal rotor for engagement with a tool for rotating said metal rotor;

a resilient presser member made of metal comprising a base portion fixedly arranged within said insulating case in the side of said other surface of said metal rotor and provided



in the form of a ring not to obstruct said formation means and spring portions integrally extending from said base portion for applying pressure with respect to said metal rotor in the vicinity of the outer peripheral portion of said other surface thereof; and

an annular sealing member fixed with respect to said base portion of said resilient presser member to block a path defined between said other surface of said metal rotor and the peripheral portions of said opening in the vicinity of the outer periphery of said other surface thereof over the entire circumference, said sealing member being formed by elastic material.

4,594,641

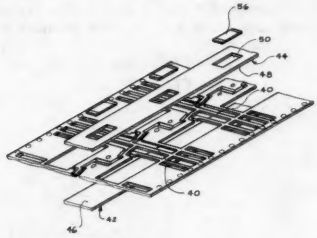
DECOUPLING CAPACITOR AND METHOD OF FORMATION THEREOF

Jorge M. Hernandez, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed May 3, 1985, Ser. No. 730,278

Int. Cl.[4] H01G *1/14, 7/00;* H01B *7/00*

U.S. Cl. 361—306 **26 Claims**



13. A capacitor including:

a first electrical conductor;

a second electrical conductor spaced from said first conductor, said first and second conductors defining a plane having opposed surfaces;

a first active lead extending from said first conductor at a first position;

a second active lead extending from said second conductor at a second position;

a first dummy lead associated with said first conductor, but electrically isolated therefrom at a third position;

a second dummy lead associated with said second conductor, but electrically isolated therefrom at a fourth position;

at least a portion of said first and second active leads and said first and second dummy leads being in the same plane;

a first layer of electrically insulative material laminated to a one of said opposed surfaces of said first and second conductors;

a second layer of electrically insulative material laminated to the other of said opposed surfaces of said conductors, said second layer having windows therethrough wherein said windows expose at least a portion of said first and second conductors and wherein said windows define a recess, said conductors, active and dummy leads and first and second insulative layers defining a laminated assembly;

at least one multilayer capacitive element in said recess and between said first and second conductors, said capacitive element having first and second conductive end surfaces, with said first conductive end surface being in electrical contact with said first conductor and said second conductive end surface being in electrical contact with said second conductor; and

encapsulate material in said recess wherein said multilayer capacitor element is encapsulated within said laminated assembly.

4,594,642

IMPREGNATING OIL FOR A CAPACITOR COMPRISING TWO METALLIZED PLASTIC FILMS AND THE CAPACITOR IMPREGNATED WITH THE OIL

Akira Ito, and Toshishige Ueno, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 613,400, May 24, 1984, abandoned. This application May 1, 1985, Ser. No. 729,352

Claims priority, application Japan, Aug. 19, 1983, 58-151422

Int. Cl.[4] H01G *4/22;* H01B *3/20*

U.S. Cl. 361—315 **3 Claims**

1. An impregnating oil for a metallized plastic film capacitor, comprising 0.1 to 10 parts by weight of an isocyanate compound selected from the group consisting of tolylene diisocyanate, 4,4'-diisocyanate-3,3'-dimethyldiphenyl and the mixture thereof and 100 parts by weight of an electric insulating oil selected from the group consisting of 1-tolyl-2-phenylethane, 1-ethylphenyl-2-phenylethane, 1-isopropylphenyl-2-phenylethane, 1,2-ditolylethane and the mixture thereof.

4,594,643

DEVICE FOR FIXING A COOLING MEMBER ON THE COOLING SURFACE OF AN INTEGRATED MODULE

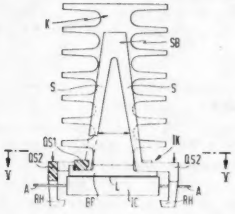
Adam Hermann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 650,659

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335332

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—386 **10 Claims**



1. A device attaching a cooling member to an integrated module having a plurality of terminal pins extending laterally

therefrom, said cooling member have a base plate with an upstanding central core having a plurality of cooling ribs extending from opposite sides thereof with free sides between said opposite sides, said device consisting of insulating material and comprising:

a pair of upstanding spaced yokes receiving said central core of said cooling member therebetween and respectively resting against said free sides thereon, each yoke having two resilient legs with free ends;

a pair of first cross bars connecting said free ends of said legs and being resiliently forced by said legs against an upper surface of said base plate; and

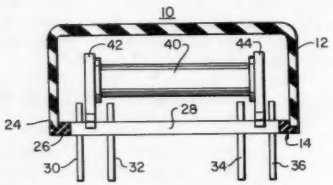
a pair of second cross bars connecting said free ends of said legs and carrying detent elements thereon, said second cross bars surrounding a portion of said integrated module and said detent elements clamping said device, said integrated module and said cooling member together.

4,594,644

ELECTRICAL COMPONENT ENCAPSULATION PACKAGE

Robert A. Painter, Winchester, Mass., assignor to Electronic Instrument & Specialty Corp., Stoneham, Mass.

Filed Oct. 22, 1984, Ser. No. 663,353
Int. Cl.[4] H02B *1/04*
U.S. Cl. 361—417 **8 Claims**



1. An electrical component encapsulation package comprising: a cover; a base including a peripheral frame removable engaging said cover and having a large central hole and a channel which includes a first surface removably engaging the bottom edge surface of said cover and a second surface removably engaging the inside surface of said cover for centering and sealing the cover; an electrical component; and non-conductive support means integral with said electrical component and connected to said frame and mounting said component above and spaced from said frame and providing an open space between the frame and component which is filled by encapsulating material.

4,594,645

ILLUMINATING REFLECTOR

Yutake Terashita, 6-12, Nigawa-Takadai, 2-chome, Takarazuka-shi, Kyogo-ken, Japan

Filed Nov. 9, 1984, Ser. No. 669,855
Claims priority, application Japan, Nov. 11, 1983, 58-212946
Int. Cl.[4] G03B *15/02*
U.S. Cl. 362—18 **4 Claims**

1. An illuminating reflector which comprises:

(a) a stick having a rearward end and a forward end, the rearward end of said stick being adapted to be detachably inserted into a stick holding aperture in an illuminator;

(b) an actuating runner slidably disposed on said stick;

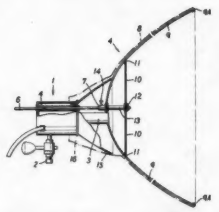
(c) means for selectively fixing said actuating running in either a first position on said stick or in a second position on said stick, said first position being forward of said second position;

(d) a plurality of dome ribs each of which has a rearward end and a forward end, the rearward end of each of said plurality of dome ribs being pivotally connected to said actuating runner;

(e) a fixed collar secured to the forward end of said stick;

(f) a plurality of struts each of which has a rearward end and a forward end, the forward end of each said plurality of struts being pivotally connected to said fixed collar and the rearward end of each plurality of struts being pivotally connected to a corresponding one of said plurality of dome ribs intermediate the rearward and forward ends thereof;

(g) a flexible reflection sheet having a forward end and a rearward end, said flexible reflection sheet being mounted on said plurality of dome ribs;



(h) a flexible cover having a forward end and a rearward end, the forward end of said flexible cover being attached to the rearward end of said flexible reflection sheet and the rearward end of said flexible cover being adapted to prevent light from the illuminator from leaking out rearwardly; and

(i) a diffuser screen detachably attached to the forward end of said flexible reflection sheet,

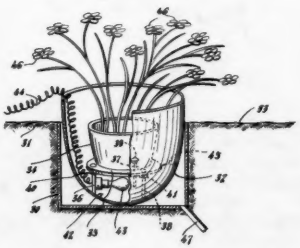
whereby, when said actuating runner is fixed in its first, forward position, said struts force said plurality of dome ribs outwardly, opening the illuminating reflector, and when said actuating runner is fixed in its second, rearward position, said struts pivot inwardly and rearwardly and said dome ribs pivot inwardly and forwardly.

4,594,646

LIGHT-REFLECTIVE DEVICE FOR ILLUMINATING CENTRIPETALLY VIEWED THREE-DIMENSIONAL OBJECTS

Henry Von Kohorn, 215 Rocky Rapids Rd., Stamford, Conn, 06903, and David Von Kohorn, 1926 Menalto Ave., Menlo Park, Calif. 94025

Filed Oct. 15, 1984, Ser. No. 660,905
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—101 **14 Claims**



1. An illuminating device for indirectly illuminating three-dimensional objects for substantially glar-free centripetally viewing comprising:

an open receptacle for supporting an object which is to be illuminated and viewed therein,

said receptacle having a reflective bottom surface and upwardly extending side walls substantially surrounding at least a lower portion of the object to be illuminated in said receptacle,

a shielding means in the form of a shelf mounted in said receptacle and spaced from said side walls and said reflective bottom surface of said receptacle, said shelf supporting the object to be illuminated in said receptacle,

a reflective surface on the undersurface of said shelf,

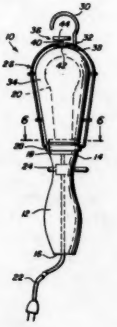
a light source mounted in said receptacle under said shelf in close proximity to an object to be indirectly illuminated thereby and in spaced relationship to said reflective bottom and said side walls whereby light from said source is reflected by the undersurface of said shelf and the bottom surface of said receptacle and directed upward surrounding said object thereby indirectly illuminating an object positioned on said shelf which totally obscures said source from a viewer.

4,594,647

ADJUSTABLE LIGHT

Louis A. Dippert, 1034 Philadelphia St., Rapid City, S. Dak. 57701

Filed Nov. 30, 1984, Ser. No. 677,060
Int. Cl.[4] F21V *15/00*
U.S. Cl. 362—376 **5 Claims**



1. A trouble light which comprises:

(a) an elongated handle member having a pair of opposed ends;

(b) an electric light socket for an electric light bulb to provide illumination, said socket being fixedly secured to one end of said handle;

(c) an extension cord extending through the other end of said handle for connecting said socket to a power supply;

(d) a guard secured to said socket to surround and protect said light bulb;

(e) a hook attached to the top of said guard for supporting same in a balanced hanging relationship;

(f) a reflector having a portion partially surrounding the light bulb adjustably supported around said socket within said guard and including a lower portion completely encircling said light socket;

(g) means for turning said reflector around said socket in 360° to direct said illumination from said bulb in any direction therefrom including a shaft attached to the top center of said reflector and extending outwardly from said guard and a knob affixed to the free end of said shaft so that said reflector can be manually turned; and

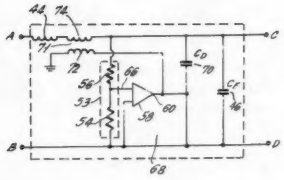
(h) means for holding said reflector in position after said reflector is turned, comprising a wave washer spring positioned on said shaft between said reflector and said guard causing friction when said knob is turned, and a flat spring mounted at one end to the inner surface of said lower portion of the reflector so that the other end of said flat spring will drag on said socket causing friction when said knob is turned, and whereby said reflector will be stabilized both as it moves and when it is stationary.

4,594,648

WIDE FREQUENCY BAND COUPLING NETWORK FOR AN ACTIVE RIPPLE AND NOISE FILTER

George C. Gallios, Setauket, N.Y., assignor to Venus Scientific Inc., Farmingdale, N.Y.

Filed Nov. 28, 1984, Ser. No. 675,342
Int. Cl.[4] H02M *1/12*
U.S. Cl. 363—46 **14 Claims**



1. A filter for filtering ripple and noise voltages from a DC voltage, said filter comprising:

a common terminal, an input terminal and an output terminal;

voltage sensing means for producing a sense signal which is proportional to an output voltage at said output terminal;

an active filtering circuit having an input for receiving said sense signal and an output terminal, said active filtering circuit being adapted to generate at said output terminal of said circuit a correction signal having a magnituide and waveform such that coupling said correction signal onto said output terminal of said filter tends to reduce said ripple and noise voltages;

a passive coupling element connected between said output terminal of said active filtering circuit and said output terminal of said filter; and

a passive filter element connected between said output terminal and said common terminal of said filter, said passive coupling element and said passive filter element having nearly identical electrical characteristics.

4,594,649

BOOTSTRAP DRIVE FOR A TWO-TRANSISTOR FORWARD CONVERTER

Paul M. Rhoads, Orlando, and Arthur H. Renkes, Longwood, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 1, 1985, Ser. No. 707,289
Int. Cl.[4] H02H *7/122*; H02M *7/537*
U.S. Cl. 363—56 **7 Claims**

1. A two transistor forward converter comprising:

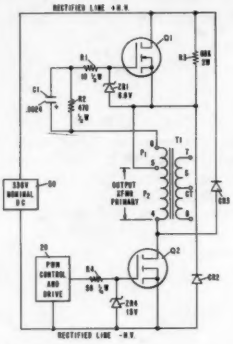
a transformer having a primary and a secondary winding, said primary winding having a first end, a second end and a tap;

first transistor means for connecting the tap of said primary winding to the high side of a power supply;

second transistor means for connecting the first end of said primary winding to the low side of the power supply;

first switch control means connected across the first end of

said primary winding and said tap for activating said first transistor means; and



second switch control means connectable to the low side of the power supply and said second switch for activating said second transistor.

4,594,650

INVERTER DEVICE

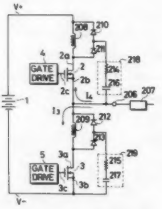
Yoshihide Kinbara, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 598,779

Claims priority, application Japan, Apr. 19, 1983, 58-68674; Aug. 1, 1983, 58-140794

Int. Cl.[4] H02H *7/122*

U.S. Cl. 363—58 **11 Claims**



1. An inverter device comprising: a DC power source, a pair of series-connected current control elements, said series-connected current control elements being connected in series with said DC power source so that a load connected to a junction between said current control elements is supplied with an output voltage by switching said current control elements alternatively, a pair of parallel circuits each comprising a pair of series-connected diodes and a reactor connected in parallel with said series-connected diodes and said reactor being connected in series with a respective one of said current control elements, and a pair of voltage spike absorbing circuits, each of said voltage spike absorbing circuits being connected in parallel with a circuit including one of said series-connected diodes and a respective one of said current control elements.

4,594,651

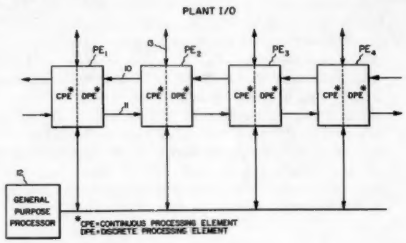
CONCURRENT PROCESSOR FOR CONTROL

Vijay C. Jaswa, Clifton Park, and Charles E. Thomas, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 18, 1984, Ser. No. 571,757

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—131 **16 Claims**



1. A digital controller comprising:

multiple substantially identical processing elements interconnected in a linear array;

each processing element having a continuous and a discrete processing element in two-way communication, the first computing continuous state variables from at least one row of a matrix equation, and the second simultaneously and asynchronously computing discrete state variables; and

communication means to transfer present continuous state variables in sequence to said processing elements which concurrently calculate next continuous state variables;

said processing elements including means for outputting computed state variables to controlled equipment.

4,594,652

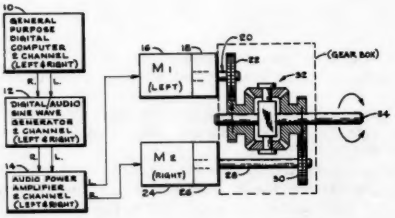
DIGITAL AUDIO DIFFERENTIAL DRIVE SYSTEM

Evert C. Mattson, Box 36, Brule, Wis. 54820

Filed Feb. 28, 1984, Ser. No. 545,549

Int. Cl.[4] H02P *1/54*; H02K *17/34*; G05B *19/18, 13/02*

U.S. Cl. 364—167 **9 Claims**


GENERAL PURPOSE DIGITAL COMPUTER 5 CHANNEL (LEFT & RIGHT)
DIGITAL/AUDIO SINE WAVE GENERATOR 2 CHANNEL (LEFT & RIGHT)
AUDIO POWER AMPLIFIER 2 CHANNEL (LEFT & RIGHT)
M1 (LEFT)
M2 (RIGHT)
(GEAR BOX)

1. A continuously infinitely variable speed, dual input mechanical differential digital control system with differentially driven output shaft comprising:

(a) A matched pair of alternating current single phase single output synchronous electric motors of fixed frequency wherein the motors have a plus or minus frequency tolerance range which allows input frequency of alternating current power to vary above and below the fixed frequency of the motors, the motors outputs engaging in opposite directions the inputs of a mechanical differential;

(b) means for computing and producing a programmed pair of digital electronic pulses, said pulses having a binary mathematical representation for controlling the speed of the differentially driven output shaft;

(c) means for producing a pair of varying audio frequency

signals from the respective varying digital electronic pulses wherein the varying audio frequency signals are proportional to the varying digital electronics pulses and within the frequency tolerance range of the synchronous motors;

(d) means for inputting the varying audio frequency signals to the motors such that the motor outputs can be varied continuously in speed and the differentially driven output shaft speed controlled according to the digital electronic pulses; and

(e) the differential having dual inputs for the synchronous motors and one output and wherein the differential output speed is one half the algebraic sum of the motor inputs, the ouput capable of a forward, reverse or zero output.

4,594,653

DATA PROCESSING MACHINE SUITABLE FOR HIGH-SPEED PROCESSING

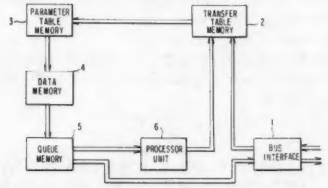
Masao Iwashita, and Tsutomu Tenma, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1982, Ser. No. 436,130

Claims priority, application Japan, Oct. 22, 1981, 56-169152; Dec. 14, 1981, 56-201272; Jan. 12, 1982, 57-2985; Jan. 26, 1982, 57-10309

Int. Cl.[4] G06F *9/00, 9/38, 13/00*

U.S. Cl. 364—200 **5 Claims**



1. A data processing machine comprising a first memory for storing destination addresses designating locations of instructions used in a data processing, a second memory accessed with the destination addresses output from said first memory and storing said instructions therein, an arithmetic means for executing an arithmetic operation in accordance with the instructions read out of said second memory, a third memory for temporarily storing first data read out from said second memory which has reached said third memory in advance of a second data which is needed together with said first data for a dyadic operation, until said second data reaches said third memory, a fourth memory for storing data read out from said third memory waiting to be processed in said arithmetic means and data waiting to be transferred to the outside of said data processing machine, interface means for receiving data to be transferred to said first memory from the outside of said data processing machine and for transferring data in said fourth memory to the outside of said data processing machine, and bus means for coupling said first to fourth memories and said arithmetic means into a ring shape, said fourth memory including a data queue memory means for storing data to be used in an operation of an instruction which does not increase the number of data to be stored back in said fourth memory, a generator queue memory means for storing data to be used in an operation of an instruction which increases the number of data to be stored back in said fourth memory, and a means for monitoring the amount of data in said data queue memory means and inhibiting an output of said generator queue memory means to said arithmetic means when said monitored amount exceeds a predetermined amount.

4,594,654

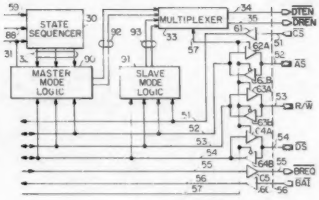
CIRCUIT FOR CONTROLLING EXTERNAL BIPOLAR BUFFERS FROM AN MOS PERIPHERAL DEVICE

Mohammad Y. Maniar, and Steven Dines, both of San Jose, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 4, 1983, Ser. No. 549,521

Int. Cl.[4] G06F *3/00, 9/22, 13/42*

U.S. Cl. 364—200 **8 Claims**



1. In a MOS integrated circuit device for operation in a microcomputer system having a bus and bus control signals for controlling communication over said bus, said device having a master mode state indicative that said device is an initiator of operations of said system and a slave mode state indicative that said device is not an initiator of operations of said system, a circuit for controlling external bipolar transceivers for driving data signals to said device from a system bus or from said device onto said bus, comprising:

timing means for generating timing signals,

a first logic unit coupled to and responsive to said timing signals and said bus control signals for generating a first transceiver control signal, including a slave mode unit responsive to signals indicative of said device states, and to bus control signals indicative of CHIP SELECT, READ/WRITE and DATA STROBE operations, said slave mode unit generating a signal active when said device has no control of said system bus and said bus control signals indicate CHIP SELECT, READ and DATA STROBE operations,

a second logic unit coupled to and responsive to said timing signals and said bus signals for generating a second transceiver control signal,

such that said first transceiver control signal is an enable signal for data signals to be transmitted by said transceivers from said device onto said system bus and said second transceiver control signal is an enable signal for data signals to be transmitted by said transceivers to said device from said system bus.

4,594,655

(K)-INSTRUCTIONS-AT-A-TIME PIPELINED PROCESSOR FOR PARALLEL EXECUTION OF INHERENTLY SEQUENTIAL INSTRUCTIONS

Hsieh T. Hao; Huei Ling, both of Chappaqua; Howard E. Sachar, New Paltz, all of N.Y.; Jeffrey Weiss, Providence, R.I., and Yannis J. Yamour, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1983, Ser. No. 475,286

Int. Cl.[4] G06F *7/00, 7/42*

U.S. Cl. 364—200 **4 Claims**

2. A pipelined processing comprising:

(a) a pipeline instruction control unit,

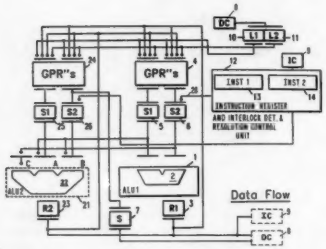
(b) a primary data flow facility having inputs and having a reference capability to process a stream of instructions defined by said instruction control unit, said primary data flow facility comprising an (n)-input adder to produce for a given instruction a result;

(c) a secondary data flow facility having inputs and capability different from said reference capability of the primary

data flow facility, comprising a (2n−1)-input adder so that the secondary data flow (2n−1)-input adder can process said inputs to said primary data flow facility n-input adder to emulate said result of processing by said (n)-input adder of said primary data flow facility as a subset of its input set;

(d) an instruction unit comprising means to detect adjacent instruction groups including:

interlocked instruction sequences where one adjacent instruction necessarily must be delayed pending completion of another;



adjacent instruction sequences in which one of a group of adjacent instructions require operand inputs including an operand input which is the result of processing the operand inputs for another instruction of the group; and

independent adjacent instruction sequences which require unrelated operand inputs; and

(e) control means connected to said instruction unit and said primary and secondary data flow facilities to control simultaneous processing of dependent adjacent instruction sequences and independent adjacent instruction sequences, and to delay processing of appropriate instructions when necessary in interlock instruction sequences.

4,594,656

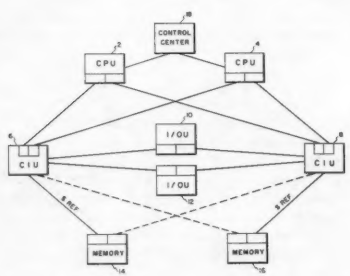
MEMORY REFRESH APPARATUS

Richard C. Moffett, 4116 W. Carol Ave., Phoenix, Ariz. 85021

Continuation of Ser. No. 387,732, Jun. 14, 1982, abandoned. This application Dec. 17, 1985, Ser. No. 810,537

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **3 Claims**



1. A distributed digital data processing system comprising:

a first computer subsystem including a first control processing unit (CPU), a first central interface unit (CIU), and a first volatile random access memory unit (MU); and a second computer subsystem including a second central processing unit (CPU), a second central interface unit (CIU) and a second volatile random access memory unit (MU), each MU storing digital data signals, being divided into m sections, with each section being divided into n groups, where m and n are integers greater than one and including means for refreshing the data signals stored there.

first means providing communications between the first CIU and the first and second CPU's, and between the first CIU and the first and second MU's,

second means providing communications between the second CIU and the first and second CPU's, and between the second CIU and the first and second MU's,

all communications between a CPU and an MU being controlled by and transmitted through a CIU;

a system control center including a first clock subsystem for the first computer subsystem and a second clock subsystem for the second computer subsystem, each clock system providing timing signals, refresh request signals and refresh address signals, the refresh address signals specifying a memory group,

third circuit means for applying the refresh request and refresh address signals of the first clock subsystem to the first CIU and first MU,

fourth circuit means for applying the refresh request and refresh address signals of the second clock subsystem to the second CIU and the second MU,

the first CIU in response to the receipt of a refresh request signal producing a refresh strobe ($REF) which is applied to the first MU and which causes the means for refreshing data signals to refresh data signals stored in the addressed blocks of the first MU; the second CIU in response to the receipt of a refresh request signal producing a refresh strobe ($REF) which is applied to the second MU and which causes the means for refreshing the data signals to refresh the data signals stored in the addressed blocks of the second MU; and

means for synchronizing the issuance of the refresh request and refresh address signals by the first and second clock subsystems.

4,594,657

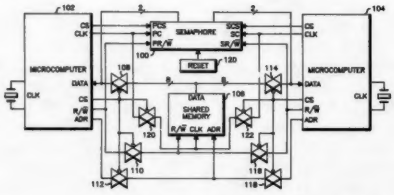
SEMAPHORE FOR MEMORY SHARED BY TWO ASYNCHRONOUS MICROCOMPUTERS

John P. Byrns, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 22, 1983, Ser. No. 487,777

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **11 Claims**



1. Semaphore circuitry for resource means shared by first and second processing means generating first and second control signals and coupled to first and second clock signals from first and second signal sources, respectively, said semaphore circuitry comprising:

first gating means coupled to the first processing means and first clock signal source for generating a first read pulse signal or a first write pulse signal in response to the first control signal and first clock signal;

first storage means coupled to the first gating means and an ownership signal for storing the ownership signal in response to the first read pulse signal;

second storage means coupled to the first gating means and

a semaphore signal for storing the semaphore signal in response to the first read pulse signal;

second gating means coupled to the second processing means and second clock signal source for generating a second read pulse signal or a second write pulse signal in response to the second control signal and second clock signal;

delay means coupled to the ownership signal for generating a delayed ownership signal;

third storage means coupled to the second gating means and delay means for storing the delayed ownership signal in response to the second read pulse signal;

fourth storage means coupled to the second gating means and the semaphore signal for storing the semaphore signal in response to the second read pulse signal;

semaphore means coupled to the first and second gating means and the second and fourth storage means for producing the semaphore signal, said semaphore signal having a first state in response to a second state of the stored semaphore signal in the second or fourth storage means, and having a second state in response to the first or second write pulse signal, where the first state of the semaphore signal indicates that the shared resource means is owned by the first or second processing means and the second state of the semaphore signal indicates that the shared resource means is not owned by either the first or second processing means;

ownership means coupled to the second and fourth storage means for producing the ownership signal, said ownership signal having a first state in response to a second state of the stored semaphore signal in the fourth storage means and having a second state in response to the second state of the stored semaphore signal in the second storage means, where the first state of the ownership signal indicates that the shared resource means is owned by the second processing means and the second state of the ownership signal indicates that the shared resource means is owned by the first processing means; and

the fourth storage means further being coupled to the first and second storage means for causing the first storage means to store the second state of the ownership signal and the second storage means to store the first state of the semaphore signal in response to the second state of the stored semaphore signal in the fourth storage means.

4,594,658

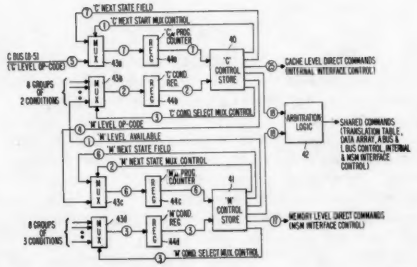
HIERARCHY OF CONTROL STORES FOR OVERLAPPED DATA TRANSMISSION

Thomas M. Steckler, Christiana, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 482,238, Apr. 5, 1983, abandoned. This application Oct. 21, 1985, Ser. No. 789,353

Int. Cl.[4] G06F *9/22*

U.S. Cl. 364—200 **7 Claims**


'C' NEXT STATE FIELD
'C' NEXT STATE MUX CONTROL
'C' PROG COUNTER
'C' CONTROL STORE
'C' COND REG
'C' COND. SELECT MUX CONTROL
C BUS (0-5) & 'C' LEVEL OP-CODE
8 GROUPS OF 2 CONDITIONS
CACHE LEVEL DIRECT COMMANDS (INTERNAL INTERFACE CONTROL)
'M' LEVEL OP-CODE
'M' LEVEL AVAILABLE
'M' NEXT STATE FIELD
'M' NEXT STATE MUX CONTROL
'M' PROG COUNTER
'M' CONTROL STORE
'M' COND REG
'M' COND. SELECT MUX CONTROL
8 GROUPS OF 3 CONDITIONS
ARBITRATION LOGIC
SHARED COMMANDS (TRANSLATION TABLE, DATA ARRAY, ABUS & L BUS CONTROL, INTERNAL & MSN INTERFACE CONTROL)
MEMORY LEVEL DIRECT COMMANDS (MSN INTERFACE CONTROL)

5. A control device for asynchronously controlling the simultaneous operation of a plurality of digital mechanisms in an overlapped manner in response to a command code from one of said mechanisms, said device comprising:

at least a first control store and a second control store each having input register means, and output means coupled to provide control signals to respective ones of said digital mechanisms, each of said output means also being coupled to its corresponding input register means to provide control state information signals thereto;

each control store being provided with a condition register to receive condition signals from its respective mechanism for transmission to the respective control store as a part of its address;

said first control store input register means being coupled to said one of said mechanisms to receive said command code as at least a part of an initial address, said first control store supplying, in response to said command code, a second command code as at least a part of an initial address to said second control stor input register means;

each control store input register means being provided with program counter means to increment a previous address to address the respective control store simulataneously with and independently of the other control store until said respective control state information signals indicate that a new address is to be received.

4,594,659

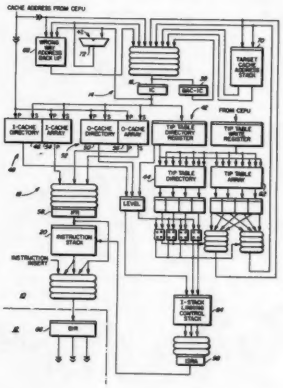
METHOD AND APPARATUS FOR PREFETCHING INSTRUCTIONS FOR A CENTRAL EXECUTION PIPELINE UNIT

Russell W. Guenthner, Glendale; William A. Shelly, Phoenix, both of Ariz.; Gary R. Presley-Nelson, San Francisco, Calif.; Kala J. Marietta, Phoenix, Ariz., and R. Morse Wade, Sunnyvale, Calif., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Oct. 13, 1982, Ser. No. 434,197

Int. Cl.[4] G06F *9/28*

U.S. Cl. 364—200 **20 Claims**



1. An instruction fetch unit for a central execution unit comprising:

instruction counter register means for storing an address of a pair of instructions;

cache means into which instructions and operands are written and out of which instructions and operands are read;

instruction stack means for storing instructions awaiting execution;

transfer and indirect prediction table means into which are recorded TIP table words including a target address of transfer and indirect instructions;

means for incrementing an address stored in the instruction

counter register means to form the address of the next pair of instructions of an instruction stream;

means for distributing the address of the pair of instructions stored in the instruction counter means to the cache means and the transfer and indirect prediction table means;

means responsive to receipt of the address distributed for accessing the cache means and the transfer and indirect prediction table means to determine if a pair of instructions having such address is stored in the cache means and if TIP table words for the addressed instructions are stored in the transfer and indirect prediction table means;

means for selecting the addressed pair of instructions from the cache means and for storing the selected addressed instructions into an instruction fetch register;

means for selecting the TIP table words for the addressed instructions from the transfer and indirect prediction table means and for checking the selected TIP table words to determine if the addressed instructions are transfer or indirect instructions and the target addresses thereof;

means for placing the pair of instructions in the instruction stack means;

means for loading into the instruction counter register means the address in the TIP table word for an instruction recorded in the TIP table word as being a transfer or indirect instruction; and

means responsive to data in the TIP table word for each instruction for predicting which instruction in the instruction stack is the next instruction to be executed by the central execution unit.

4,594,660

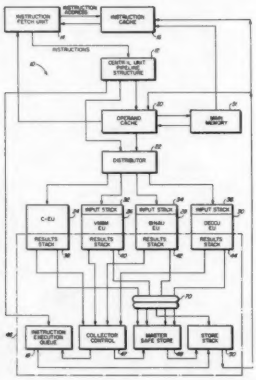
COLLECTOR

Russell W. Guenthner; Gregory C. Edgington, both of Glendale; Leonard G. Trubisky, Scottsdale, and Joseph C. Circello, Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Oct. 13, 1982, Ser. No. 434,129

Int. Cl.[4] G06F *9/28, 9/38*

U.S. Cl. 364—200 **19 Claims**



1. A collector for a synchronous central processing unit (CPU) of a data processing system having program addressable registers, a memory, said CPU having a repertoire of instructions and a plurality of execution units, wherein each of said execution unit executes a different subset of the repertoire of instructions independently of and in parallel with the other execution units and each executes the instructions in the order in which instructions are received by each such execution unit, said CPU having means for issuing in program order instructions to the collector and to the execution unit capable of executing the issued instruction; each execution unit that executes any instructions that requires more than one clock period having associated with it an input stack for storing instructions awaiting execution by its associated execution unit in the order received, the number of clock periods required to execute each instruction differing such that the results of the execution of instructions of a given program by the instruction execution units are not produced in program order; the collector comprising:

means for storing in program order instructions issued by the means for issuing instructions to the collector;

result means associated with each of said execution units for storing a plurality of results of the execution of instructions by its associated execution unit in the order executed;

a master safe store and a store stack for storing the results in program order of the execution of each instruction executed by the execution units; and

collector control means responsive to the order in which instructions are stored in the means for storing in program order instructions for causing results stored in the result means associated with each execution unit to be stored in program order in the master safe store if the results change the contents of an addressable register and to be stored in the store stack in program order if the results are to be written into memory.

4,594,661

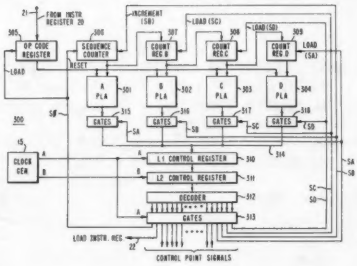
MICROWORD CONTROL SYSTEM UTILIZING MULTIPLEXED PROGRAMMABLE LOGIC ARRAYS

Victor S. Moore, Pompano Beach; Gerard A. Veneski, Boca Raton; Tony E. Parker, Boca Raton; Joseph C. Rhodes, Jr., Boca Raton; Wayne R. Kraft, and William L. Stahl, Jr., both of Coral Springs, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,660

Int. Cl.[4] G06F *9/28*

U.S. Cl. 364—200 **27 Claims**



1. In a microprogrammed data processor wherein a sequence of microwords are used to control the execution of each processor instruction, an improved microword control system comprising:

a plurality of programmable logic array mechanisms responsive to the processor instruction to be executed for individually producing different ones of the microwords needed to execute such instruction;

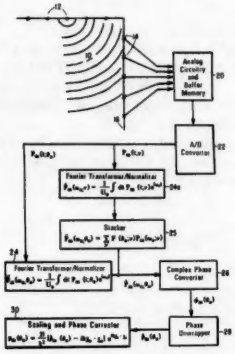
microword-responsive control circuitry for controlling the operation of the data processor;

and multiplexing circuitry for selectively supplying microwords from different ones of the programmable logic array mechanisms to the control circuitry during different time intervals.

4,594,662
DIFFRACTION TOMOGRAPHY SYSTEMS AND METHODS WITH FIXED DETECTOR ARRAYS

Anthony J. Devaney, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 441,323, Nov. 12, 1982. This application Sep. 19, 1983, Ser. No. 533,391
Int. Cl.[4] G01V *5/00;* G01N *29/00;* G06F *15/42*
U.S. Cl. 364—400 28 Claims



1. A method for the tomographic reconstruction of a subsurface geological formation which has diffracted at least one wave of energy interacting with it, comprising the steps of:

(a) obtaining one or more signals which are a function of at least one of the phase and amplitude of the diffracted propagating wave after said wave has interacted with said formation;

(b) preprocessing said obtained signals, wherein said preprocessing includes the step of scaling and phase correcting signals; and

(c) converting said preprocessed signals by means of a filtered backpropagation technique into an array representing the partial reconstruction profile of the formation.

21. A method for tomographic reconstruction of a three-dimensional object comprising:

(a) directing at a view angle on a plane one or more waves of energy toward an object being examined;

(b) detecting as a function of time the one or more fields produced by said one or more waves;

(c) producing one or more signals which are functions of said one or more detected fields;

(d) preprocessing said produced signals wherein said preprocessing includes,

converting said produced signal from analog to digital form;

transforming said digital signals over time with a Fourier transform;

normalizing said transformed signals;

complex phase converting said normalized signals;

phase unwrapping said complex phase converted signals scaling and phase correcting said phase unwrapped signals;

(e) filtering said preprocessed signals according to a filtered backpropagation technique;

(f) changing said view angle on said plane;

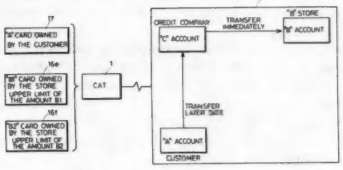
(g) changing said plane on which said waves of energy are directed at a view angle; and

(h) repeating steps a-g at a sufficient number of different planar orientations such that a full three-dimensional reconstruction of the object profile can be obtained.

4,594,663
CREDIT TRANSACTION PROCESSING SYSTEM

Masanori Nagata, Kyoto; Toshiaki Inoue, and Mamoru Hirayama, both of Takatsuki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jul. 8, 1983, Ser. No. 512,022
Claims priority, application Japan, Jul. 9, 1982, 57-120070
Int. Cl.[4] G06F *15/30*
U.S. Cl. 364—401 5 Claims



1. A credit transaction processing system comprising:

a credit authorization terminal having a card receiving means;

a first card adapted to be insertable into said card receiving means;

first recording medium means provided on said first card for storing merchant transaction data, said merchant transaction data including data indicating a maximum permitted amount of credit purchase and a plurality of account numbers respectively identifying merchant accounts into which funds may be electronically transferred;

a second card adapted to be insertable into said card receiving means;

second recording medium means provided on said second card for storing customer transaction data;

keypad means provided on said credit authorization terminal for inputting numeric data;

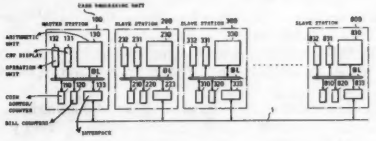
reader means provided in said credit authorization terminal for reading said merchant transaction data from said first card when said first card is inserted in said receiving means and for reading said customer transaction data from said second card when said second card is inserted in said receiving means;

processing means, responsively connected to said keypad means and said reader means, for determining whether said numeric data satisfies a predetermined relationship with one of said merchant and customer transaction data.

4,594,664
CASH PROCESSING METHOD AND SYSTEM

Koichi Hashimoto, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Sep. 29, 1982, Ser. No. 427,925
Claims priority, application Japan, Dec. 2, 1981, 56-194140
Int. Cl.[4] G07G *1/12, 7/48, 15/20*
U.S. Cl. 364—405 3 Claims



1. In a cash processing system comprising a plurality of cash processing units, each processing unit having;

a coin sorter/counter for sorting coins collected through sales in cash registers by each kind of denomination and counting each of the sorted coins;

a bill counter for counting bills collected through sales in the cash registers for each kind of denomination;

an arithmetic unit for aggregating count data as sales data obtained by said coin sorter/counter and said bill counter and storing the aggregated data into a buffer area thereof; and

an operation unit at least having ten keys for inputting a code number of a sales department to which a cash register whose sales amount is to be processed belongs, and an accept key, to be operated upon completion of processing of sales amounts with respect to the code number inputted by the ten keys, for initiating further processing of sales amounts,

a cash processing method comprising the steps of:

designating one unit of said plurality of cash processing units as a master station and the rest of the units as slave stations;

connecting the arithmetic unit of each slave station to the arithmetic unit of the said master station by means of communication lines;

transmitting the sales data stored in said buffer area together with said code number to said master station by way of said communication lines in response to the operation of the accept keys provided in said slave station keys; and

aggregating, by the arithmetic unit of said master station, sales data transmitted from each of said slave stations and sales data obtained in the cash processing unit of said master station with respect to each of said code numbers.

4,594,665

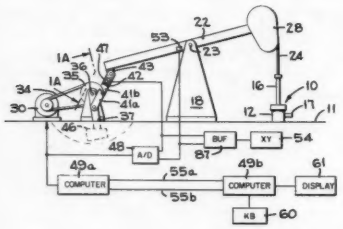
WELL PRODUCTION CONTROL SYSTEM

Rangasami S. Chandra, Walnut Creek; Stephen G. Quen, Fremont; Donald E. Eineichner, and Jorge E. Lastra, both of San Jose, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 13, 1984, Ser. No. 579,628

Int. Cl.[4] G06F *15/20*; F04B *49/00*

U.S. Cl. 364—422 **12 Claims**



9. Apparatus for monitoring the operation of a well pumping unit having a sucker-rod string and a power unit to reciprocate said rod string to produce fluid from an underground location, said apparatus having means for continuously compensating for a drift in characteristics of transducers used in monitoring said operation, said apparatus comprising:

first transducer means for generating a signal representative of a load on said rod string;

second transducer means for generating a signal representative of a position of said rod string;

means for using said load signal and said position signal to generate a dynagraph of load vs. position of the sucker-rod string;

means for calculating the area of said dynagraph;

means for comparing said calculated area of said dynagraph with a predetermined set of area limits;

means for comparing a maximum value of load signal against an acceptable maximum value of load signal;

means for comparing a minimum value of load signal against an acceptable minimum value of load signal;

means for combining current values of load signals with previous vales of load signals to eastablish a selected value, and for combining a current value of rod position signal with previous values of rod position signals to establish a reference position of said rod string when said maximum value of said load, said minimum value of said load and said dynagraph area are each within acceptable limits;

means for monitoring said load signal when said rod string reaches said reference position; and

means for disabling said power unit when said value of said load signal exceeds said selected value at said reference position.

4,594,666

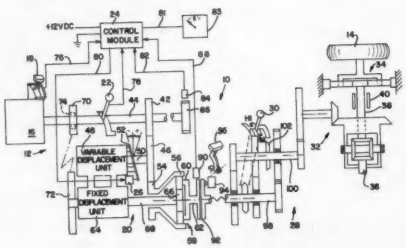
TRANSMISSION MONITOR/CONTROL MICROPROCESSOR FOR CONTINUOUSLY VARIABLE POWER TRAIN

Charles R. Cornell, Naperville, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 11, 1983, Ser. No. 512,832

Int. Cl.[4] B60K *41/08*; G06F *15/20*

U.S. Cl. 364—424.1 **1 Claim**



1. Efficiency control for an engine-transmission power train of a fuel-powered vehicle of the type including a fixed range transmission having a plurality of fixed, specific reduction ratios providing corresponding speed ranges and a variable range transmission providing a continuously variable range of speed reduction ratios, said variable range transmission being equipped with transmission pump and motor hydraulic units with variable displacement to vary their speed ratio, and electrically controlled hydraulic means to vary such displacement and correspondingly vary the variable transmission output speed and torque, said variable transmission including manual means for varying the variable transmission output speed and torque comprising:

a command signal generator for connection to the electrical hydraulic means to provide thereto a main command signal for setting desired output speed of the transmission by varying the pump-and-motor speed-ratio of same as it is driven under engine power;

means for storing in a memory a predetermined consecutive series of desired engine speed values which result in substantially minimum brake specific fuel consumption for a range of enging power setting;

first means connected to the memory for generating a reference command indicative of that particular engine speed value which is desired corresponding to the actual engine power setting; and

second means for generating a second signal indicative of the actual engine speed;

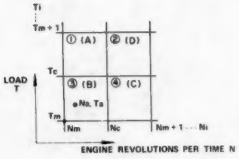
third means for generating a third signal indicative of the setting of the manual means for varying the variable transmission output speed and torque;

said first and second and third means having means connected to the signal generator for modifying the main command signal automatically, in response to a deficiency of one of said reference command and second signal compared to the other.

4,594,667
DIGITAL CONTROL SYSTEM

Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 30, 1984, Ser. No. 574,748
Claims priority, application Japan, Feb. 10, 1983, 58-21059
Int. Cl.[4] F02M 25/06; F02D 5/00
U.S. Cl. 364—431.06 8 Claims



1. A digital control system for controlling a controlled object according to at least one controlled variable concerning the controlled object, comprising:

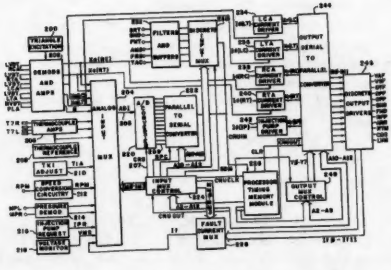
(a) memory means having a plurality of memory addresses each address comprising N bits in which at least two instructions, each instruction comprising at least one bit, are stored, the number of instructions the satisfying equation $K \leqq 2^n$, where K is the number of instructions, n is the number of bits per instruction, and $n \leqq N/2$; and

(b) control means which processes information in units of N bits, accesses one of the memory addresses according to the measured value of the detected controlled variable, fetches one of the instructions in the address according to said measured variable value, and outputs a command signal to the controlled object to perform a predetermined operation according to the contents of the fetched instruction.

4,594,668
TURBOCHARGER CONTROL SYSTEM

Charles S. Fujawa, and Sara B. Masteller, both of South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 16, 1983, Ser. No. 467,069
Int. Cl.[4] F02D 23/00; F02B 37/12
U.S. Cl. 364—431.02 21 Claims



1. A turbocharger control system for an engine having a turbocharger with a variable output compressor driven by a variable input turbine, said compressor boosting the pressure of an input manifold of the engine and said turbine being run from the exhaust gases of the engine, said control system comprising:

a computing circuit including input circuit means for receiving input signals representative of operational parameters of said engine, programmable memory means for storing predetermined tabular data and sequential and computational instructions, processor means responsive to said memory means for receiving said input signals and generating a plurality of output signals as a function of said input signals, tabular data, and instructions, and output circuit means for outputing said plurality of output signals,

sensor means connected to said engine and said computing circuit for sensing the pressure in said manifold, the temperature of said exhaust gases, the speed of said engine, and position of the throttle, compressor and turbine actuators of said engine and generating signals representative thereof;

and actuator means connected to said output circuit means for controlling the position of said actuators in response to predetermined ones of said output signals, respectively;

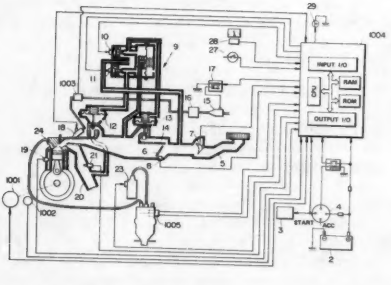
said computing circuit, sensor means, and actuator means defining a turbine control loop for regulating the input of the exhaust gasses to the turbine as a function of the error difference between an optimum manifold pressure of the engine and the actual manifold pressure of the engine; and

a compressor control loop for regulating the output of airflow from the compressor as a function of the speed and acceleration of the engine, said compressor control loop generating a high position request value as a function of engine speed and providing the most efficient output from the compressor available at a particular engine speed, a low position request value as a function of engine speed and providing the highest output from the compressor available without surge when the engine is accelerating and further including means for detecting an acceleration of the engine and for generating an acceleration signal and means, responsive to said acceleration signal, for switching to said low position request value from said high request value when the engine is accelerating, said actuator means being responsive to said high and low position request values for regulating the output of the compressor.

4,594,669
ICE CONTROL METHOD INCLUDING CONTROL SCHEDULE UPDATE

Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 27, 1983, Ser. No. 565,600
Claims priority, application Japan, Dec. 29, 1982, 57-229921
Int. Cl.[4] F02D 37/02
U.S. Cl. 364—431.05 22 Claims



1. In a control method for an apparatus wherein the fuel consumption characteristics thereof change with use, the steps of:

(a) continuously sensing at least two parameters of said apparatus, one of said parameters being related to fuel consumption;

(b) maintaining a control schedule related to said sensed parameters and periodically updating said control schedule in response to the values of the parameters sensed in step (a) during both transient and non-transient modes of operation; and

(c) controlling said apparatus in accordance with said con-

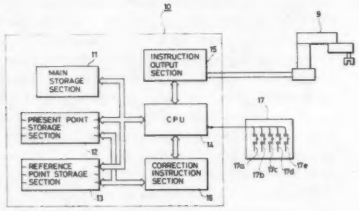
trol schedule so as to minimize the fuel consumption of same.

4,594,670

ROBOT CONTROL APPARATUS

Atsushi Itoh, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,621
Claims priority, application Japan, Feb. 21, 1983, 58-27266
Int. Cl.[4] G05B *19/42*
U.S. Cl. 364—513 **11 Claims**



1. An apparatus for controlling a robot having a plurality of arms of the multiarticulation type, comprising:

a main storage section for storing work point data and work procedure instructions for said robot;

a present point storage section for storing present angular position data of each of said plurality of arms of said robot;

a reference point storage section for storing reference angular position data for each of said plurality of arms of said robot when said robot is actuated;

a central processing unit for producing a signal for instructing said robot to effect predetermined operations on the basis of said work point data, said work procedure instructions, said present angular position data, and said reference angular position data; and

a correction section for determining an angular deviation of an actual position of each of said plurality of arms from angular positional data corresponding to a present angular position to thereby correct said stored angular positional data on the basis of the determined angular deviation, whereby correction of said stored angular positional data is achieved without use of additional physical structure.

4,594,671

VELOCITY METHOD OF CONTROLLING INDUSTRIAL ROBOT ACTUATORS

Koichi Sugimoto, Hiratsuka; Kiyohide Koizumi, Tokyo; Toyohide Hamada, Yokohama, and Shinichi Arai, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1983, Ser. No. 458,998
Claims priority, application Japan, Feb. 19, 1982, 57-24361
Int. Cl.[4] G05B *19/407, 11/32*; B25J *9/00*; G09C *0/00*
U.S. Cl. 364—513 **8 Claims**

1. A method of controlling an industrial robot for moving a hand of the robot along a predetermined path of travel the method comprising the steps of:

reading a present displacement of each of a plurality of actuators for moving the hand;

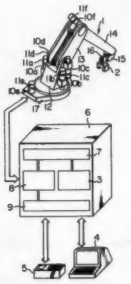
calculating, at present time, a present position vector p indicating a present position of the hand and present posture unit vectors f, g indicating a present posture of the hand based on the present displacements of the actuators;

providing a sampling time interval T for controlling the hand;

providing a projected translational distance d to be covered by the hand during the sampling time interval T;

providing a target position vector p_f indicating a target position of the hand and target posture unit vectors f_f, g_f indicating target posture of the hand;

calculating an estimated translational vector Δp indicating an estimated translational movement of the hand from the present position toward the target position during the sampling time interval T, an estimated rotation unit vector



e indicating an axis of rotation of the hand from the present posture toward the target posture and an estimated rotation angle $\Delta\phi$ of the hand around the rotation unit vector e from the present posture toward the target posture during the sampling time interval T, by the following relationships;

$$\Delta\vec{p} = \frac{d}{|\vec{p_f} - \vec{p}|}(\vec{p_f} - \vec{p})$$

$$\vec{e} = (\vec{f_f} - \vec{f}) \times (\vec{g_f} - \vec{g}) / |(\vec{f_f} - \vec{f}) \times (\vec{g_f} - \vec{g})|$$

$$\Delta\phi = \frac{2d}{|\vec{p_f} - \vec{p}|} \tan^{-1} \frac{\vec{e} \cdot (\vec{g} \times \vec{g_f})}{\vec{g} \cdot \vec{g_f} - 2(\vec{e} \cdot \vec{g})^2 + 1}$$

calculating a command velocity of each of the actuators based on the estimated translational vector Δp, estimated rotation unit vector e and estimated rotation angle $\Delta\phi$;

calculating a revised command velocity of each of the actuators by reducing the command velocity of each of the actuators by a same rate so that any one of the revised command velocities of the actuators does not exceed a predetermined maximum allowable velocity of a concerned actuator; and

driving each of the actuators with the revised command velocity.

4,594,672

MULTI-COLUMN PLOTTER

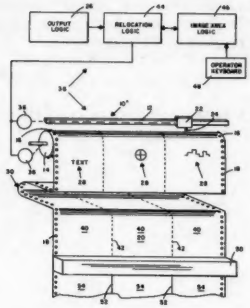
Howard E. Brewer, Santa Ana, and A. William Lyons, II, Seal Beach, both of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 4, 1983, Ser. No. 538,876
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—520 **6 Claims**

1. In a graphics drum plotter system which has a writing head driven traversely across a driven drum rotating to move strip paper therebeneath in response to X,Y coordinate defining output signals from a source to the writing head and the drum to create a series of unit plots across the paper, the improvement comprising:

(a) means for defining margin numbers and locations for longitudinally dividing the strip paper into columns; and,

(b) means disposed between the source, the writing head and the drum for sequencing complete individual portions of



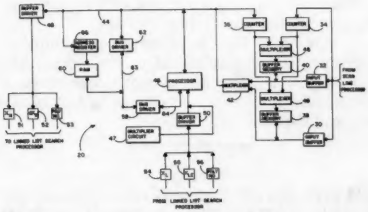
plots across said columns before advancing the strip paper.

4,594,673

HIDDEN SURFACE PROCESSOR

James R. Holly, San Diego, Calif., assignor to GTI Corporation, San Diego, Calif.

Filed Jun. 28, 1983, Ser. No. 509,152
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—522 **20 Claims**



1. A hidden surface processor to distinguish between the hidden and visible surfaces of a pair of video scan line segments relative to a viewpoint, one of said segments being positioned behind the other, said segments comprising one or more picture elements and forming portions of a three dimensional scene, and said hidden surface processor including:

first memory means including buffer memories to store information regarding a first scan line segment including the location thereof relative to an arbitrary set of axes,

second memory means including a random access memory to store information regarding the second scan line segment including the location thereof relative to said set of axes,

processor means interconnected with said first and second memory means for accessing the memories thereof and for comparing the information regarding the first and second scan line segments to determine whether the respective locations of said segments relative to one another are such that at least a portion of one of said segments is obscured by the other of said segments with respect to the viewpoint, and

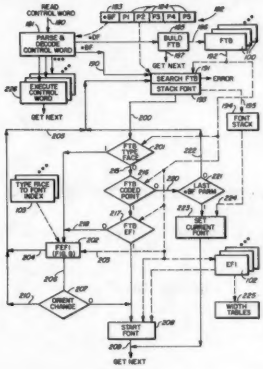
multiplier means interconnected with said processor means for multiplying together certain of the information stored in said first and second memory means for providing an indication of the distance from the viewpoint to a picture element which forms one of said first or second scan line segments.

4,594,674

GENERATING AND STORING ELECTRONIC FONTS

Dorothy I. Boulia; Michael W. Pousson, Jr.; Edward J. Pring, and Nancy L. Stone, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 18, 1983, Ser. No. 467,973
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—523 **10 Claims**



1. The method of managing a large plurality of electronic fonts in a text-processing system having a computer and data storage, each said font having a plurality of symbol-representing font symbol-representing data suitable for creating visual images of the represented symbols, respectively, said represented symbols all having a plurality of typeface attributes common to all represented symbols in a font the fonts being in families of fonts;

in said text-processing said text-processing system executing the machine-executable steps of:

in said data storage, addressably storing sets of said symbol-representing data as addressable electronic font objects and such that said symbol-representing data sets are individually addressable within any electronic font object by a symbol ID;

in said data storage, storing a plurality of addressable code tables, each said code table having two sections, a first section storing a set of code points identifiable within an expected test stream to be received and each code table having an arbitrary set of such code points, and having a second section storing a subset of said symbol IDs of an electronic font and arranged such that each of said symbol IDs in said subset correspond to a one of said code points in the respective one of said code tables such that receipt of a code point in a text stream identifies a symbol ID in accordance with the code table being addressed for said text stream addressing such code table;

defining and storing in said data storage, coded fonts including giving each coded font an address of a one of said code tables and an address of a one of said addressable electronic font objects such that each includes one address of a one of said code pages and an address of one of said electronic font objects, giving each coded font a name for making each of said coded fonts addressable as a separate entity for selecting it as a currently electronic font;

selecting a one of said coded fonts as said current electronic font for processing said expected text stream for selecting one code table and one electronic font object;

selecting a second electronic font only by identifying a one of said common typeface attributes and making said selection a second electronic font definition;

in said data storage an index of a large plurality of said common typeface attributes and addresses of associated ones of said electronic font objects;

receiving from said expected text stream said second electronic font definition and combining said one selected typeface attribute and said current electronic font, then searching said index to find an address of an electronic font object having said one common typeface in an electronic font within the family of fonts to which the current electronic font is a member; and

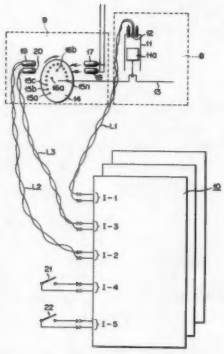
building a coded font using the address of the same code table as said current electronic font and the address of the electronic font object identified via said index.

4,594,675

SAMPLING MEASUREMENT DATA GENERATION APPARATUS

Yasuo Yoshizawa, Yonezawa, Japan, assignor to Yoshiki Industrial Co., Ltd., Yonezawa, Japan

Filed Aug. 26, 1983, Ser. No. 526,865
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—558 **4 Claims**



1. A sampling measurement data generation apparatus comprising:

means for generating a continuous analog signal which represents a physical state of a moving object to be measured;

an encoder mechanically coupled to said moving object so as to move in synchronism with the moving object;

means for generating sampling signals having a period corresponding to movement of said encoder;

means for generating a measurement start signal and a measurement end signal for presetting a measurement range corresponding to movement of said encoder;

means for sampling said continuous analog signal using said generated sampling signals;

means for generating clock signals;

means for counting the number of said clock signals which appear between each of adjacent two of said sampling signals generated by said sampling signals generation means;

means for converting said sampled analog signal into digitial signals; and

means for storing said digital signals;

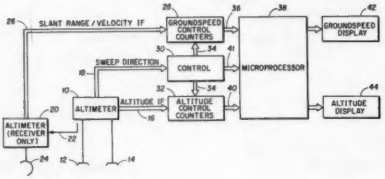
whereby the sampling period is determined by the output of said means for counting with said number of said clock signals being related to said digital data stored in said storing means.

4,594,676

AIRCRAFT GROUNDSPEED MEASUREMENT SYSTEM AND TECHNIQUE

Arlen E. Breiholz; Robert H. Pool, both of Marion, and Glenn W. Sellers, Cedar Rapids, all of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1982, Ser. No. 453,676
Int. Cl.[4] G01S *13/58*
U.S. Cl. 364—565 **22 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 67 Pages)



1. An aircraft groundspeed measurement system comprising:

means for transmitting a radar signal from an aircraft towards a target area;

first means for receiving reflected radar return signals from a target area vertically beneath an aircraft and providing an output representing aircraft altitude;

second means for receiving reflected radar return signals from a target area at a slant angle forward of the aircraft and providing an output representing aircraft slant velocity along said slant angle and aircraft slant range to said target area along said slant angle; and

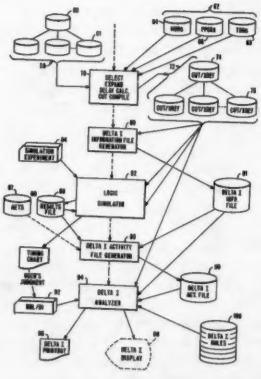
means responsive to said output representing altitude, slant range, and slant velocity, for calculating and providing an output signal representing aircraft groundspeed for a mathematical relationship correlating said altitude, slant range and slant velocity.

4,594,677

SYSTEM FOR DETECTING AND DIAGNOSING NOISE CAUSED BY SIMULTANEOUS CURRENT SWITCHING

John P. Barlow, Owego, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1983, Ser. No. 550,150
Int. Cl.[4] G01R *31/28*; G06F *15/31*
U.S. Cl. 364—578 **37 Claims**



32. A simulation method for detecting and diagnosing noise

generated by at least one device in a logic circuit, the steps comprising:

(a) simulating a logic experiment;

(b) identifying data corresponding to each device that contributes noise;

(c) performing post analysis of the results of said simulation as enabled by said identifying data;

(d) creating an activity file of events representing the operation of each of said identified noise contributing devices; and

(e) determining the total amount of instantaneous noise created by the noise contributing devices.

4,594,678

DIGITAL PARALLEL COMPUTING CIRCUIT FOR COMPUTING $P=XY+Z$ IN A SHORTENED TIME

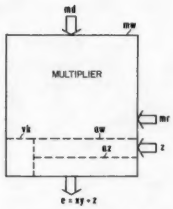
Arnold Uhlenhoff, Emmendingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 10, 1983, Ser. No. 465,386

Claims priority, application European Pat. Off., Feb. 18, 1982, 82200196.2

Int. Cl.[4] G06F 7/544

U.S. Cl. 364—736 **7 Claims**



1. A digital parallel computing circuit for positive and negative binary numbers, said negative binary numbers being represented in two's complement form, said circuit forming an output binary number which is the sum of a third binary number (z) with the product (x·y) of a first binary number (x) and a second binary number (y), said computing circuit comprising:

an adder including full-adder stages;

a multiplier including full adders including outputs, said full adders arranged in a plurality of columns and rows, said columns being arranged according to the binary weight of the digits of said output binary number, said rows including an output row, and each said full adder having an AND gate associated therewith except for said adders in said output row;

said full-adder stages forming an additional row between the next to the last of said rows and said output row;

each said full-adder stage including an augend and addend input, one of said augend or addend input of the full adder stage in the column corresponding to the most significant binary weight and the augend and addend inputs of the other ones of said full adder stages being connected to the outputs of said full adders within said next to the last of said rows of said multiplier;

each full-adder stage having a sum output and each full-adder having an augend input, each said full-adder stage sum output being connected to said augend input of a full adder in the same one of said columns and in said output row;

each said full-adder stage having a carry output and each said full adder having an addend input with each said full-adder stage carry output being connected to the addend input of the full adder in said output row which is in the next more significant binary weighted column;

each said full-adder stage having a carry input, said third binary number be represented by digit signals, and said third binary number digit signals being applied to said full-adder stage carry inputs; and

sign-correcting stage means coupled to said full-adder stages and said full-adders for generating a sign signal for said output number.

4,594,679

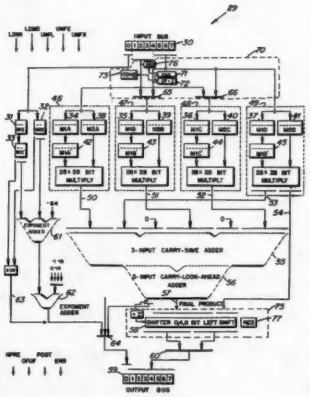
HIGH SPEED HARDWARE MULTIPLIER FOR FIXED FLOATING POINT OPERANDS

Steven L. George, and James L. Hefner, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 21, 1983, Ser. No. 515,845

Int. Cl.[4] G06F 7/52, 11/00

U.S. Cl. 364—754 **9 Claims**



1. A high speed digital multiplier unit for mulitplying two operands in a parallel fashion, comprising:

a fixed point and floating point multiplication means further comprising:

an input bus for receiving said operands;

a plurality of registers coupled to said input bus for receiving at least a portion of each of two operands;

a plurality of parallel multipliers, each of said plurality of parallel multipliers coupled to at least two of said plurality of registers for generating the partial produce created by multiplying the contents of at least two of said plurality of registers;

an adder means coupled to each of said plurality of parallel multipliers for summing the partial products generated by each of said plurality of parallel multipliers to produce a final product;

a plurality of exponent registers coupled to said input bus for receiving the sign and exponent information associated with said two operands;

a logic means coupled to at least two of said plurality of exponent registers for generating a resultant sign bit;

an exponent adder means coupled to at least two of said plurality of exponent registers for generating a plurality of resultant characteristic bits;

an exponent assembler means coupled to said adder means, said logic means and said exponent adder means for assembling the correct sign and characteristic bits associated with said final product;

a shifter means coupled to said adder means and at least one of said plurality of multipliers for performing any necessary shifts of the final product;

a fraction assembler means coupled to said shifter means for assembling the correct fraction bits associated with said final product; and

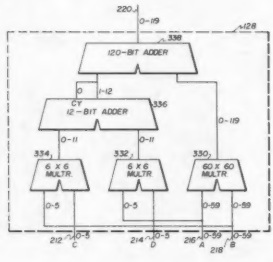
an output bus coupled to said exponent assembler means and said fraction assembler means for receiving the sign, characteristic and fraction bits which comprise the product of said two operands.

4,594,680

APPARATUS FOR PERFORMING QUADRATIC CONVERGENCE DIVISION IN A LARGE DATA PROCESSING SYSTEM

John R. Schomburg, New Brighton, and Louis B. Bushard, Andover, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed May 4, 1983, Ser. No. 491,520
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—765 **11 Claims**



1. An augmented multiplier for use in a binary division circuit of a large data processing system comprising:

a 60×60 bit multiplier circuit connected to receive a first and a second input;

a first 6×6 multiplier circuit connected to receive a third input and the second input of said 60×60 bit multiplier circuit;

a second 6×6 multiplier circuit connected to receive a fourth input and the first input of said 60+60 bit multiplier circuit;

a 12 bit adder circuit connected to both of said first and second 6×6 bit multiplier circuits to receive a first 12 bit signal from said first 6×6 bit multiplier circuit, and a second 12 bit signal from said second 6×6 bit multiplier circuit and to add together said first and second 12 bit signals and to provide a carry signal when one is produced by the addition of these two 12 bit signals; and

a 120 bit adder circuit connected to said 12 bit adder circuit and to said 60×60 bit multiplier circuit to receive, and add together, the result of an addition of said first and second 12 bit signals, a carry signal, where one is produced, and the result produced by said 60×60 bit multiplier to provide a single output signal.

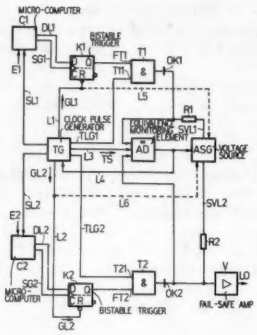
4,594,681

DATA PROCESSING SYSTEM SAFETY OUTPUT CIRCUITS

Wolfgang Eue, Brunswick, and Horst Strelow, Cremlingen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,602
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1981, 3137450
Int. Cl.[4] G06F *11/16*
U.S. Cl. 364—900 **15 Claims**

1. A data processing system safety output circuit for checking binary signals of a pair of binary signal paths, comprising: a pulse generator means for providing test pulses and clock pulses and including means for inhibiting clock pulses when test pulses are not received at a test pulse input; a memory means for transferring binary signals and a switch means connected to an output of the memory means in each binary signal path; each switch means having an output connected to a respective input of a comparator circuit means, said comparator circuit means being connected to receive said test pulses from the pulse generator means, said comparator circuit means emitting test pulses back to the test pulse input of the pulse



generator means given a proper comparison of the signals from the switch means; each of said switch means emitting an output signal when both a clock pulse from the pulse generator means and an output signal from the memory means is received; and test pulses from the comparator circuit means also being coupled to a control means.

4,594,682

VECTOR PROCESSING

Edward G. Drimak, Johnson City, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,190
Int. Cl.[4] G06F *15/347, 12/00*
U.S. Cl. 364—900 **7 Claims**

1. An apparatus for adapting a scalar data processor having a cache memory connected between main memory and a central processing unit, for efficient vector processing including:

means for defining separate scalar and vector data areas in said cache memory,

vector mode selection means for selectively enabling access to either said vector or scalar data areas of said cache memory,

cache memory addressing means including separate vector and a scalar addressing means responsive to said vector mode selection means and said central processing unit for accessing either said vector or scalar data areas of said cache memory,

wherein said central processing unit includes:

a pair of operand registers, and

a result register,

coupling means for providing a data path from said operand registers to an ALU and a further data path from an ALU to said result register,

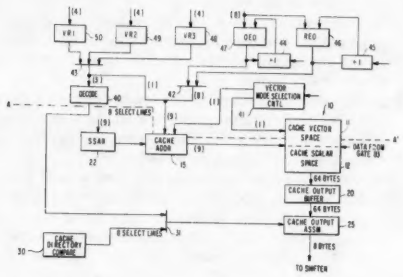
second coupling means for providing a data path from said cache memory to one of said operand registers and to said result register;

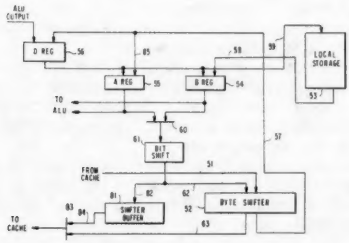
an output buffer;

third coupling means providing a data path from either of said operand registers to said second coupling means and to said output buffer;

fourth coupling means providing a data path from said sec-

ond coupling means or said output buffer to said cache memory; and





fifth coupling means providing a data path from said result register to either of said operand registers.

4,594,683

APPARATUS FOR FIXING A COORDINATE POINT WITHIN A FLAT DATA REPRESENTATION

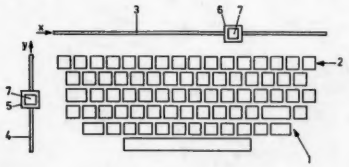
Joachim Frank, Kriegsstrasse 15, D-6831 Oberhausen-Rhsn. 1, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 509,218

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225298; Sep. 7, 1982, 3233115

Int. Cl.[4] G06F *3/033, 3/16*

U.S. Cl. 364—900 **4 Claims**



1. Apparatus as a working aid for blind and partially sighted people for communication with a computer system with a keyboard and with a screen output for a screen as an output device for determining a raster coordinate point of said screen output and for producing an electrical data signal corresponding to said coordinate point, said apparatus including a device for converting the read-out data into speech or as a large picture, wherein at least two data call-up devices are provided capable to call up the data corresponding to a certain coordinate point in the form of two only end position-stable sliders movable independently of one another in two coordinate directions perpendicular to one another, thus defining by their relative coordinate position said certain coordinate point, one of said sliders being arranged above or below and one of said sliders being arranged to one of the sides of said keyboard, a position detection device being provided at each slider for supplying an electrical signal corresponding to the displacement path of this slider along one of the coordinate directions being subdivided in raster sections, and said call-up devices having a data call-up release device to call up said converted read-out data corresponding to said certain coordinate point at a desired moment.

4,594,684

SYSTEM AND METHOD FOR MEASURING THE AREA AND DIMENSIONS OF APERTURES IN AN OPAQUE MEDIUM

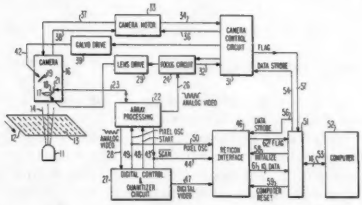
Frank S. Krufka, Mount Joy, Pa., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 572,150, Jan. 19, 1984, Pat. No. 4,556,902.

This application Oct. 2, 1985, Ser. No. 768,749

Int. Cl.[4] G06F *3/037*

U.S. Cl. 364—900 **4 Claims**



1. An interface circuit for providing a selected two pulses of a pulse train to a computer comprising:

gate means responsive to said pulse train and to enable signals for providing output pulses;

means responsive to said output pulses for providing data inputs to a computer when said gate means is enabled;

first logic means responsive to data strobe signals and to scan signals for providing a first enable signal to said gate means;

counter means responsive to said data strobe signals for providing count output pulses in response to said data strobe signals;

comparator means responsive to said count output pulses, said comparator means having a first input terminal for receiving said count output pulses and a second input terminal for receiving a fixed 2 count, said comparator means having a control output terminal and providing a control pulse when the input signals to said first and second input terminals are equal whereby said control pulse is provided in response to the second of said data strobe signals; and

second logic means responsive to said control output terminal, the output of said second logic means being coupled to an input terminal of said gate means whereby said second logic means normally enables said gate means and inhibits said gate means in response to said control pulse.

4,594,685

WATCHDOG TIMER

Jeffrey Owens, The Colony, Tex., assignor to General Signal Corporation, Stamford, Conn.

Filed Jun. 24, 1983, Ser. No. 507,413

Int. Cl.[4] G06F *9/22, 11/28*

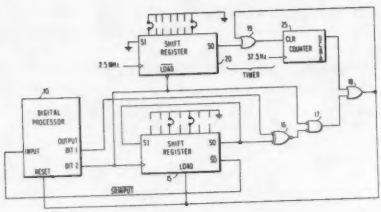
U.S. Cl. 364—900 **11 Claims**

1. Apparatus for tracking appropriate program execution of a digital processor including:

program means stored in a memory of said digital processor and including first and second program segment means,

said first program segment means including means for accessing a watchdog routine for passing a bit pattern to said watchdog routine and accepting a bit pattern therefrom,

said second program segment means comprising said watchdog routine which includes means for (1) outputting a particular bit of said bit pattern passed on said access, (2) manipulating said bit pattern in a predetermined fashion, (3) returning said manipulated bit pattern to said accessing routine and (4) sequentially changing a clocking bit from an initial condition to a different temporary condition and



back to said initial condition, and, external to said processor

bit pattern means including an input for storing another bit pattern, and including means for:

(1) manipulating said another bit pattern in a manner identical to said predetermined fashion, and

(2) comparing said outputted particular bit with a selected bit of said stored another bit pattern each time said clocking bit exhibits said sequential changes, and

reset means for resetting said processor if said comparison effected by said bit pattern means results in an inequality.

4,594,686

LANGUAGE INTERPRETER FOR INFLECTING WORDS FROM THEIR UNINFLECTED FORMS

Kunio Yoshida, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

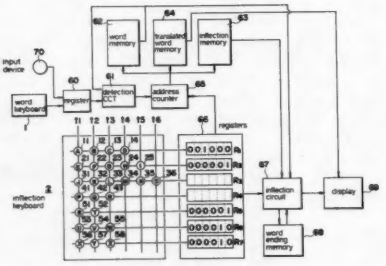
Continuation of Ser. No. 181,877, Aug. 28, 1980, abandoned. This application Oct. 25, 1983, Ser. No. 545,216

Claims priority, application Japan, Aug. 30, 1979, 54-110864

The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.

Int. Cl.[4] G06F *15/38*

U.S. Cl. 364—900 **4 Claims**



1. An electronic word inflection device wherein an uninflected word represented in a first language is entered to obtain at least one inflected form of the uninflected word, the device comprising:

first memory means for storing digital data representing a plurality of words in the language in their respective uninflected forms;

input means for entering an uninflected word, the input means being operatively connected to the first memory means, said device comprising means for determining that the input uninflected word is stored within the first memory means of the device;

inflection memory means for storing digital data representing a certain number of principles used in the language to inflect the uninflected forms of the words stored in the first memory means;

inflection selection means, responsive to the input means, for selecting and retrieving that digital data stored in the inflection memory means that corresponds to the inflected form of the uninflected input word,

said inflection selection means including several groups of key switches operatively associated with said input means, each of the groups corresponding to one set of the principles used in the language to inflect words, and separate register means, responsive to the several groups of key switches, for storing the digital data retrieved from the first memory means;

inflection enabling means, responsive to the inflection selection means, for modifying the digital form of the uninflected input word to obtain a digital representation of the inflected form of the input word,

said inflection enabling means including an amend circuit means operatively connected to the register means for modifying the digital data representing the word from that of the inflected form in response to digital data in the register means; and

display means, responsive to the inflection selection means, for modifying the digital form of the uninflected input word to obtain a digital representation of the inflected form of the input word.

4,594,687

ADDRESS ARITHMETIC CIRCUIT OF A MEMORY UNIT UTILIZED IN A PROCESSING SYSTEM OF DIGITALIZED ANALOGUE SIGNALS

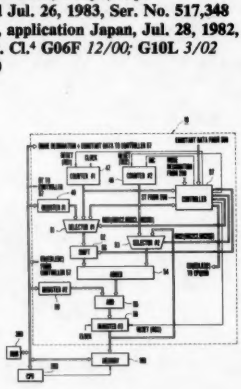
Takao Kaneko, Zama; Hironori Yamauchi, and Atsushi Iwata, both of Isehara, all of Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,348

Claims priority, application Japan, Jul. 28, 1982, 57-131589

Int. Cl.[4] G06F *12/00*; G10L *3/02*

U.S. Cl. 364—900 **1 Claim**



1. An address arithmetic circuit used for generating addresses for a memory unit used in digitally processing of analog signals wherein different address control signals are required for different signal processing algorithms, said address arithmetic circuit comprising:

first and second counters;

first and second registers, and a third register acting as an address register of said memory unit;

a first selection circuit for selecting either one of the outputs of said first or second counters and of said first register;

a shift circuit for shifting an output of said first selection circuit;

a second selection circuit for selecting either one of the outputs of said second counter or said third register;

an adder for adding together outputs of said shift circuit and said second selection circuit;

an AND gate circuit for obtaining a logical product of an output of said adder and an output of said second register for each bit, and for setting said logical product in said third register;

a controller including first, second, third and fourth arithmetic circuits, said first arithmetic circuit resetting said first counter and incrementing said second counter in accordance with the output of said first counter, said first arithmetic circuit resetting said second counter, said second arithmetic circuit controlling selection operation of said first and second selectors, said third arithmetic circuit controlling a number of shifts of said shift circuit, said fourth arithmetic circuit resetting said third register.

4,594,688

POWER SUPPLY CIRCUIT FOR FLIP-FLOP MEMORY

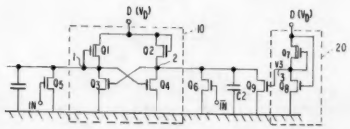
Takashi Uno, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1982, Ser. No. 416,765

Claims priority, application Japan, Sep. 10, 1981, 56-142741

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—95 **18 Claims**



1. A memory device, comprising; first and second nodes, a power supply terminal, a reference voltage terminal, first load means coupled between said power supply terminal and said first node, second load means coupled between said power supply terminal and said second node, a first field effect transistor coupled between said first node and said reference voltage terminal and having a gate coupled to said second node, a second effect transistor coupled between said second node and said reference voltage terminal and having a gate coupled to said first node, a third field effect transistor coupled in parallel with said second field effect transistor, voltage detection means coupled to said power supply terminal and said reference voltage terminal for detecting when the potential at said power supply terminal assumes an intermediate value lower than a predetermined power supply value and means for rendering said third field effect transistor conducti ve when said detection means detects said intermediate value, whereby the electric charge at said second node is discharged by said third transistor when the potential of said power supply terminal is at said intermediate value.

4,594,689

CIRCUIT FOR EQUALIZING BIT LINES IN A ROM

William J. Donoghue, Round Rock, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 4, 1984, Ser. No. 646,718

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—182 **11 Claims**

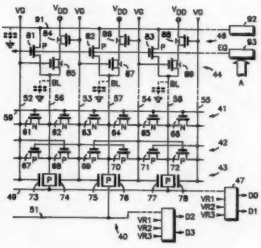
1. A non-volatile memory, comprising:

a plurality of bit lines, each bit line having a capacitance associated therewith;

a plurality of memory cells having outputs coupled to the plurality of bit lines;

a plurality of equalization transistors, each coupling transistor having a first current electrode coupled to a bit line associated therewith, a second current electrode coupled to an equalization line which has a capacitance associated therewith, and a control electrode for receiving an equalization pulse;

reference means for charging the capacitance of the equalization line to a predetermined voltage prior to the occurrence of the equalization pulse, and for providing a high impedance at least during the occurrence of the equalization pulse; and



equalization pulse generator means, coupled to the plurality of equalization transistors, for generating the equalization pulse in response to an address transition.

4,594,690

DIGITAL STORAGE APPARATUS INCLUDING SECTIONS EXHIBITING DIFFERENT ACCESS SPEEDS

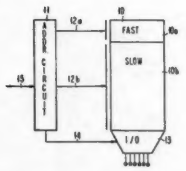
Richard F. Meyers, Sindelfingen; Francis Rossi, Boeblingen, and Werner Strähle, Dettenhausen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,316

Claims priority, application European Pat. Off., Jul. 27, 1983, 83107386.1

Int. Cl.⁴ G11C *8/00*

U.S. Cl. 365—230 **2 Claims**



1. A digital storage apparatus organized in block storage format for storing a block of data where each block contains data words comprising:

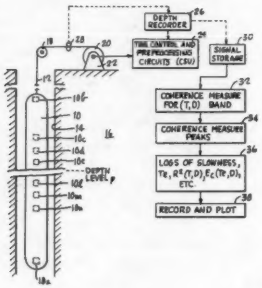
a plurality of word storage elements, a first word portion of said plurality of storage elements having an access time shorter than the access time exhibited by a second portion formed by the remainder of said plurality of word storage elements,

address and control circuit means connected to said word storage elements, and common to said plurality of word storage elements to access a block of data, for generating different selection signals for said first and second portions of said plurality of storage elements, wherein at the initiation of a memory block access cycle said first word portion is accessed and thereafter the next word portions are accessed at a shorter time interval than a memory cycle time to compensate for the longer access time.

4,594,691
SONIC WELL LOGGING

Christopher V. Kimball, West Redding, and Thomas L. Marzetta, Danbury, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 335,758, Dec. 30, 1981, abandoned.
This application Mar. 27, 1984, Ser. No. 593,932
Int. Cl.[4] G01V *1/32, 1/34, 1/40*
U.S. Cl. 367—32 39 Claims

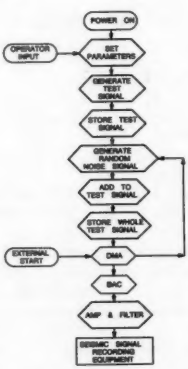


1. A well logging method comprising:
deriving logs of the respective receiver outputs of a multi-receiver sonic tool for a selected borehole interval;
stacking moveout-corrected receiver outputs by depth level and identifying selected peaks of a coherence measure of the result without reliance on first motion detection; and
producing logs of sonic properties of the formations versus borehole depth on the basis of selected parameters of said peaks.

4,594,692
SEISMIC SIGNAL GENERATOR

Randol R. Read, Tulsa, and John W. Supernaw, Broken Arrow, both of Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Jun. 27, 1983, Ser. No. 508,303
Int. Cl.[4] G01V *1/22;* G01C *17/38*
U.S. Cl. 367—13 14 Claims

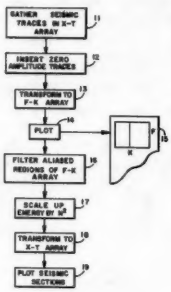


1. A system for testing seismic signal recording equipment stacking and filtering performance characteristics, comprising:
(a) signal generating means for generating a test signal which simulates the response of at least one seismic sensing device to an energy impulse imparted into the earth, the test signal comprising a first component representative of a seismic wavelet and the earth's seismic reflectivity, and the test signal further comprising a second component representative of random noise which simulates the output of at least one seismic sign sensing device; and
(b) circuitry means for applying the test signal to the seismic recording equipment.

4,594,693
SEISMIC TRACE INTERPOLATION USING F-K FILTERING

Keh Pann, Richardson, and Jerry L. Fields, Plano, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,901
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—43 7 Claims



1. In seismic exploration of the earth's formations, the method of suppressing aliasing caused by coarse sampling along a line of exploration comprising:
gathering seismic traces representing the amplitude of seismic reflections as a function of time and distance along said line of exploration;
inserting zero amplitude traces between said seismic traces;
transforming said traces into an f-k array of digital samples representing amplitude as a function of frequency and wave number;
filtering said f-k array with a filter which mutes all samples in a region of frequency and wave number which has aliasing; and
transforming the filtered f-k array into a seismic section representing amplitude as a function of time and distance.

4,594,694
SOUND SOURCE SEARCHING DEVICE

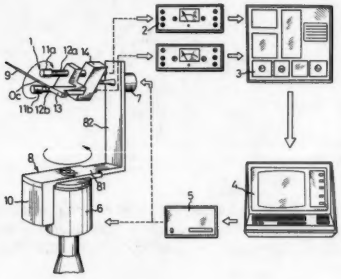
Katsuyuki Tanaka, Okazaki; Yasuhiro Kimura, Anjo; Masanori Kato, Toyoake, and Satosi Kuwakado, Nukata, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 2, 1983, Ser. No. 528,962
Claims priority, application Japan, Sep. 6, 1982, 57-155032
Int. Cl.[4] G01S *3/80*
U.S. Cl. 367—120 7 Claims

1. A sound source searching device for searching an objective sound source comprising:
an intensity probe provided with one pair of microphones;
a probe driving means for supporting said intensity probe and rotating said intensity probe stepwise in a first plane and in a second plane which perpendicularly intersects the first plane about a middle point of said microphones by a predetermined angle;
a frequency analyzing means for analyzing the frequency of the sound pressure signals fed from said intensity probe at every rotating step and forming a cross spectrum of sound pressure signals;
a processing means for calculating acoustic intensity corre-

sponding to the frequency of the objective sound source from the cross spectrum; and

a direction indicating means for indicating the direction in



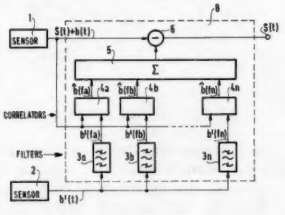
which the absolute value of acoustic intensity is the minimum in the second plane including the direction in which the absolute value of acoustic intensity is the minimum in the first plane.

4,594,695

METHODS AND DEVICE FOR ATTENUATING SPURIOUS NOISE

Michel Garçonnat, Ris Orangis, and Philippe Morgand, Athis Mons, both of France, assignors to Thomson-CSF, Paris, France

Filed Sep. 9, 1983, Ser. No. 530,824
Claims priority, application France, Sep. 9, 1982, 82 15279
Int. Cl.⁴ H04B *1/06*
U.S. Cl. 367—135 **3 Claims**



1. A device for attenuating wideband noises disturbing a tracked acoustic signal in a system including a first, acoustic-type sensor for receiving said acoustic signal and providing an output signal, and a second sensor for supplying an output signal corresponding to the noise alone, said device comprising:

filtering means for filtering on a spectrum-line basis the output signal of said second sensor so as to provide an energy density signal for each spectral line where a spurious noise component is present;

correlating means for phase shifting the energy density signals and for correlating each phase shifted energy density signal with the output signal of said first sensor in order to simultaneously obtain as many correction signals as there are energy density signals being simultaneously supplied;

adding means for adding the simultaneously obtained correction signals to provide an adder output signal; and

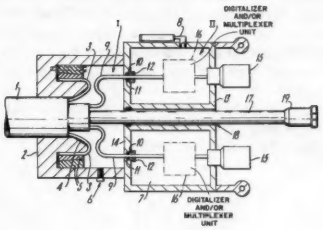
subtracting means for subtracting, from the output signal of the first sensor, the output signal of the adding means in order to provide an electrical image of the tracked acoustic signal.

4,594,696

GUN CABLE TERMINATION

Eldar K. Lien, Hosle, and Sverre Caspersen, Oslo, both of Norway, assignors to Geophysical Company of Norway A.S., Hovik, Norway

Filed Apr. 26, 1984, Ser. No. 603,914
Claims priority, application Norway, May 13, 1983, 831705
Int. Cl.⁴ H04R *1/02*; B63B *21/04*; G01V *1/04, 1/06*
U.S. Cl. 367—144 **16 Claims**



1. A seismic gun-cable termination for attachment to an end of a seismic cable-gun used for towing air/water guns behind a seismic vessel, the cable including a pressure hose, signal conductors and tension wire, comprising:

a connector housing;

a first chamber and a second separate watertight chamber in said housing;

a first wall in said housing forming one end of said first chamber;

a second wall in said housing spaced from said first wall and disposed between and separating said chambers and forming on one side thereof one end of said second chamber;

a third wall in said housing forming the other end of said second chamber opposite said first end thereof;

a hole through said first wall for receiving the end of the gun-cable to be connected inserted therethrough;

fastening means for fastening the tension wires of the gun-cable to said housing within said first chamber;

sealed passages through said second wall for receiving inserted therethrough individually and in sealed relationship therewith the conductors extending through said first chamber and said second chamber;

underwater connectors mounted in and extending through said third wall for connection with the conductors;

a central separate channel in said housing through said second chamber for receiving the pressure hose extending therethrough from said first chamber through said second and third walls;

a water-repellant lubricant filling said first chamber;

a hydrophobic, water-emulsifying liquid filling said second chamber; and

a pressure-compensating means operatively mounted on said housing in communication with said second chamber for controlling the pressure therein.

4,594,697

PNEUMATICALLY-OPERATED LIQUID SLUG PROJECTOR APPARATUS

Adrien P. Pascouet, 1854 S. Gessner, Houston, Tex. 77063

Filed May 25, 1983, Ser. No. 498,013
Int. Cl.⁴ G01V *1/14, 1/38*
U.S. Cl. 367—146 **8 Claims**

1. A liquid slug projector apparatus, comprising:

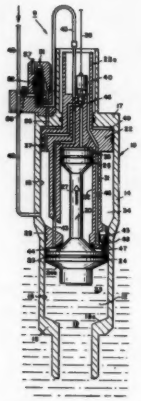
a generator having a housing including a first bore having a bottom stop wall defining a main port;

a second bore having a top stop wall defining a top port;

a first shuttle having a first piston, a second piston, and a push rod interconnecting said first and second pistons;

a second shuttle having a third piston, a fourth piston, and

an interconnecting push rod defining a third bore therein;
said first piston being slidably mounted in said first bore;
said second piston being slidably mounted in said third bore;
said third piston being slidably mounted in said first bore;
said fourth piston being slidably mounted in said second bore;
said second shuttle having a sleeve which slidably and sealingly extends from said fourth piston through said top port;
said first bore defining a slug chamber for containing a liquid slug between said bottom stop wall and said first piston;
said second bore defining a return chamber between said fourth piston and said top stop wall;
said third bore defining with said second piston a trigger chamber;
a vent chamber formed between said first and third pistons;
a main reservoir chamber formed between said first and second shuttles and having a first inlet;



an air-operated valve having a second inlet and a valve element having two operative positions;
said first and second inlets being adapted to continuously receive compressed air from a single air line;
said compressed air maintaining said shuttles in a rest position and then abruptly releasing said first shuttle from said second shuttle, thereby abruptly expelling said confined liquid slug at a very high-velocity through said main port into said liquid body;
said valve element in one operative position supplying compressed air from said air line to said return chamber to cause said second shuttle to move toward and lock with said first shuttle; and
said valve element in another operative position venting said return chamber to the outside medium thereby causing said locked shuttles to return to their rest position.

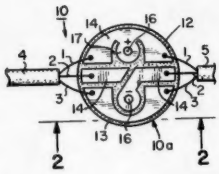
4,594,698

PRINTED-CIRCUIT DISC FOR STRINGING GEOPHONES

Fred W. Hefer, Houston, Tex., assignor to Oyo Corporation, Houston, Tex.

Continuation of Ser. No. 309,248, Oct. 7, 1981. This application Oct. 23, 1984, Ser. No. 663,688
Int. Cl.[4] H04R *11/00*
U.S. Cl. 367—188 **9 Claims**

1. In combination:
a connector insulator disc having a dielectric element and flat conductive strips on one face of the element, the strips being arranged in spaced insulated relation, the dielectric element having a pair of transverse holes which extend between the opposite faces of the disc and through a pair of particular conductive strips; and



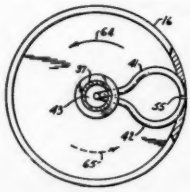
a seismic detector having a pair of external terminals, each terminal extending through a particular corresponding hole and through the conductive strip surrounding such hole.

4,594,699

FARADAY-EFFECT MAGNETO-OPTIC TRANSDUCER APPARATUS OF A ROTARY FORM

Lewis B. Browder, Altadena, Calif., assignor to Datatape Incorporated, Pasadena, Calif.

Continuation of Ser. No. 693,486, Jan. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 505,640, Jun. 20, 1983, abandoned. This application Dec. 19, 1985, Ser. No. 811,327
Int. Cl.[4] G11B *11/00*
U.S. Cl. 369—13 **7 Claims**



1. In a magneto-optic transducer apparatus of a rotary form for use with a magnetic storage device having an information-bearing surface producing magnetic fields, said transducer apparatus including first movable light-directing means for scanning an entering beam of polarized light along an operation path, second light-directing means, synchronously movable with said first light-directing means in association with the operational path, for receiving entering light, to form a beam of polarized light exiting said transducer apparatus, and a planar element having a light transmission property for modulating polarized light in accordance with an applied magnetic field, said element being interposed between said first light-directing means and said second light-directing means adjacent the information-bearing surface of such magnetic storage device, for influenece by a magnetic field that is capable of varying the light transmission property of said element, the improvement wherein:
(a) said first light-directing means is arranged for scanning light leaving said first light-directings means along an operational path which is immediately adjacent to and substantially parallel with the information-bearing surface of such magnetic storage device; and
(b) said planar element is positioned transverse to the entering light beam as it leaves said first light-directing means, with opposing surfaces of said planar element being adjacent respectively the exit end of said first light-directing means and the entrance end of said second light-directing means, to cause entering light scanned along the operational path by said first light-directing means to be re-

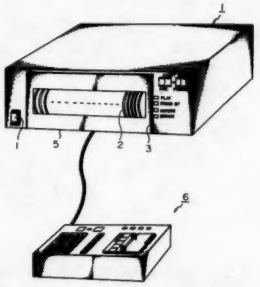
ceived by said second light-directing means after transmission through said planar element in close proximity to the information-bearing surface of such magnetic storage device, whereby the beam of light exiting said transducer apparatus is modulated with respect to the entering light beam because of the Faraday magneto-optic effect.

4,594,700

AUTOMATIC DISC PLAYER SYSTEM WITH DISC SELECTING AND LOADING MEANS

Hideyuki Takahashi; Isami Kenmotsu; Takahiro Okajima, and Yoshio Takahashi, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 373,163, Apr. 29, 1982, abandoned. This application Nov. 9, 1984, Ser. No. 670,128
Claims priority, application Japan, May 2, 1981, 56-067396
Int. Cl.[4] G11B *17/00, 5/48*
U.S. Cl. 369—39 **7 Claims**



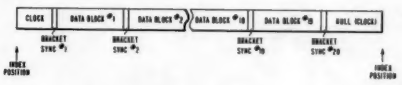
1. An automatic disc player system comprising:
a cabinet means having an entrance port with a door;
a holder means disposed within said cabinet means and adapted to removably receive a plurality of discs in upright position along a horizontal axis so that said discs are juxtaposed with each other;
a disc playing means;
a carrier means on which said disc playing means is mounted and linearly movable in a direction parallel to said horizontal axis within a range of movement including a home position at which said carrier means is at rest;
a disc transportation means mounted on said carrier means for transporting a selected one of said discs between said holder means and said disc playing means; and
a control means for controlling the opening and closing of said door, including
(a) a manually operable door control switch for generating a door operation command signal;
(b) a carrier position detection switch associated with said carrier means, for generating a carrier position detection signal when said carrier means is resting in the home position;
(c) a driving means connected to said door for opening and closing said door in response to said door operation command signal; and
(d) a transmission means connected between said door control switch and said driving means and responsive to said carrier position detection signal for transmitting said door operation command signal only when said carrier position detection signal is present.

4,594,701

SYSTEM FOR RECORDING DATA ON SPIRAL TRACK

Allen M. Earman, Burlington County, N.J., and James Y. Higashi, King County, Wash., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1983, Ser. No. 547,039
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—43 **18 Claims**



1. In an information recording and playback system for use with a disc-shaped record medium having a convolution of spiral track recorded on a surface thereof, said convolution having recorded information stored thereon, and further having an unrecorded region of said surface abutting one end of said convolution, an apparatus for providing piecemeal recordings on said surface wherein a subsequent recording is made on said unrecorded region abutting one end of said convolution, said apparatus comprising:
means for rotating said record medium;
transducer means for detecting said information stored in said convolution;
means for generating an error signal representative of the position of said transducer means relative to said convolution;
means for effecting radial motion of said transducer means relative to said convolution;
switch means for selectively applying, in a first position, said error signal to said means for effecting radial motion and, in a second position, a dc voltage level to said means for effecting radial motion; and
means coupled to said transducer means and responsive to said information stored in said convolution for placing said switch means from said first position to said second position when said transducer means detects information stored near said end of said convolution abutting said unrecorded region, and responsive to said end of said convolution for initiating recording on said unrecorded region abutting said convolution.

4,594,702

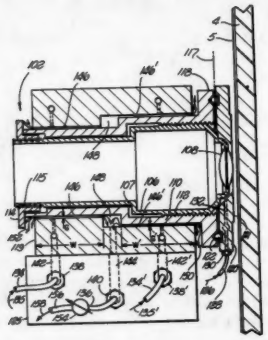
FLUID BEARING FOR AXIALLY MOVABLE HEAD

Rodney S. Livingston, Long Beach, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Nov. 12, 1982, Ser. No. 440,936
Int. Cl.[4] G11B *21/10*
U.S. Cl. 369—45 **17 Claims**

1. A method for supporting an optical read head in spaced relationship to a moving information storage medium, the read head having a lens assembly movable within a housing, said method comprising the steps of:
supporting by an air bearing the lens assembly slidable within the housing, an annular air exhaust chamber being provided between the ends of said housing, one longitudinal wall and one lateral wall of the annular chamber being integral with the lens assembly, and the opposite longitudinal wall and opposite lateral wall of the annular chamber being integral with the housing;
introducing air under pressure into annular gaps formed between an outer surface of the lens assembly and an inner surface of the housing on each side of the annular chamber to produce an air bearing journal between the members;
providing a relatively fixed resilient biasing force on the lens assembly relative to the housing to urge the lens assembly away from the storage medium; and

regulating the air pressure exhausting the annular air exhaust chamber to provide a variable biasing force on the lens



assembly relative to the housing in a direction opposite that of said relatively fixed biasing force.

4,594,703

CLOCK-SIGNAL REPRODUCING CIRCUIT INCLUDING VOLTAGE CONTROLLED OSCILLATOR

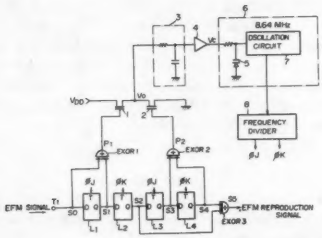
Norio Tomisawa, and Shinji Aoshima, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 5, 1984, Ser. No. 658,263

Claims priority, application Japan, Oct. 14, 1983, 58-157935[U]

Int. Cl.[4] G11G *5/02, 5/09, 27/36;* **H03L** *7/00*

U.S. Cl. 369—59 **6 Claims**



1. A clock-signal reproducing circuit for reproducing a clock signal from a repetitive pulse signal comprising:

(a) voltage-controlled oscillator means for generating a first repetition signal of which frequency varies in accordance with a voltage of a control signal applied thereto;

(b) circuit means responsive to said first repetition signal for outputting a second repetition signal which is synchronized with said first repetition signal, said second repetition signal being the clock signal;

(c) first latch means for latching the repetitive pulse signal responsive to the clock signal;

(d) first phase-difference detector means for detecting a first phase difference between the repetitive pulse signal and an output signal of said first latch means;

(e) second latch means responsive to the clock signal for latching a delayed signal which is the output of said first latch means delayed by a predetermined period of time;

(f) second phase-difference detector means for detecting a second phase difference between the delayed signal and an output signal of said second latch means; and

(g) voltage generating means responsive to signals outputted from said first and second phase-difference detector means for generating a voltage as said control signal, said voltage being of such a value that said voltage-controlled oscillator means generates said first repetition signal having such a frequency to cause said first and second phase differences to coincide with each other.

4,594,704

SPARE SUBSCRIBER TERMINAL DEVICE IN A DIGITAL CONCENTRATOR

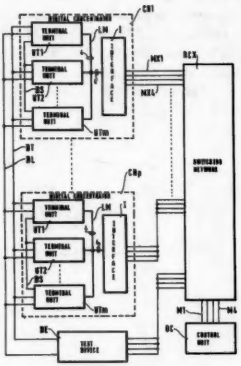
Yves Ollivier, Kerguinien, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Nov. 16, 1984, Ser. No. 672,325

Claims priority, application France, Nov. 23, 1983, 83 18645

Int. Cl.[4] H04J *1/16*

U.S. Cl. 370—16 **2 Claims**



1. A spare subscriber terminal device in a digital concentrator connected to a line test bus and to a terminal test bus, a concentrator comprising: terminal units each of which is constituted by a plurality of terminals, each of which is associated with a terminal relay, one of the terminals and the terminal relay associated therewith in one of the terminal units serving as a spare terminal and as a spare relay respectively, each terminal relay having a first set of contacts for connecting two wires of a subscriber line to the terminal in the rest position of the relay and to the line test bus in the working position of the relay, and a second set of contacts for connecting the terminal to the two wires of the subscriber line in the rest position of the relay and to the terminal test bus in the working position of the relay, each terminal unit including a logic control circuit controlling the terminal relays, the improvement wherein the terminal units of the concentrator are interconnected by a spare bus which is internal to the concentrator, wherein the first set of contacts of the spare relay is directly connected to the spare bus which acts as a subscriber line for the said spare relay, wherein each terminal unit further includes an isolating relay having a first set of contacts connected via two line wires to all the terminal relays for connecting the said line wires to the spare bus in the rest position of the isolating relay and to the line test bus in the working position of the isolating relay, and a second set of contacts connected via two junctor wires to all of the terminal relays for connecting the said junctor wires to the terminal test bus in the working position of the isolating relay and for isolating the said junctor wires from the terminal test bus in the rest position of the isolating relay, wherein the said line wires and the said junctor wires are normally isolated from the subscriber lines and the terminals at the said terminal relays so long as the terminal relays are in the rest position and are connected by the first and second sets of contacts of the terminal relays to the subscriber line wires and to the terminals respectively when the terminal relays are in the working posi-

tion, wherein the isolating relays are normally at rest and one of the terminal relays is in the working position when the terminal associated therewith is faulty, and wherein to test subscriber lines and terminals in a terminal unit, the isolating relay of the said terminal unit is put into the working position, and the terminal relays thereof are successively put into the working position.

4,594,705

BUS-CONFIGURED LOCAL AREA NETWORK WITH DATA EXCHANGE CAPABILITY

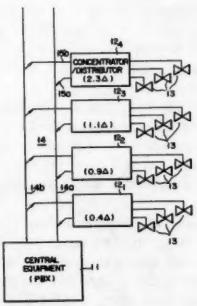
Haruki Yahata, Fujisawa, and Hiroshi Kobayashi, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 29, 1984, Ser. No. 594,896

Claims priority, application Japan, Mar. 31, 1983, 58-53763; Mar. 31, 1983, 58-53764

Int. Cl.[4] H04Q *11/04;* H04J *3/02, 1/16, 3/14*

U.S. Cl. 370—67 **17 Claims**



1. A bus-shaped local area network comprising:

a central equipment having an input and an output;

a bi-directional signal transmission line having one end connected to said input and output of said central equipment; and

a plurality of local equipments connected to said signal transmission line downstream of said control equipment, and each having at least one terminal connected to said bi-directional signal transmission line;

said central equipment comprising means for transmitting, on a time division basis, data signals addressed to said local equipments to said signal transmission line, and said local equipments each comprising means for transmitting a data signal from said terminal to said central equipment via said signal transmission line in response to the reception of a data signal transmitted from said central equipment and addressed to the respective local equipment;

said central equipment including means for generating control signals addressed to said local equipments in response to the reception of signals transmitted from said local equipments, the control signals being transmitted over said signal transmission line on a time division basis; and said local equipments each including means for controlling a transmission start timing of a data signal to be transmitted to said central equipment via said signal transmission line in response to a control signal addressed to the respective local equipment.

4,594,706

PACKET COMMUNICATION SYSTEMS

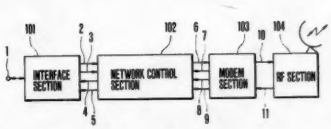
Kazutomo Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,572

Claims priority, application Japan, Apr. 22, 1983, 58/71054; Apr. 25, 1983, 58/72381; Apr. 25, 1983, 58/72382

Int. Cl.[4] H04J *3/06*

U.S. Cl. 370—89 **6 Claims**



1. In a packet communication system of a multiacess type in which a single communication medium is commonly used and wherein said communication medium is divided into a plurality of channels, respective users observe states of use of respective channels, and the probability of packet transmission to respective channels is controlled in accordance with observed information, the improvement comprising:

a memory circuit for storing a plurality of parameters, each corresponding to a respective channel;

means for transmitting a packet when a transmission request for a given channel is made, by using said corresponding parameter of the channel as the probability of packet transmission;

carrier detecting means for checking whether a channel is in a transmission state or not;

collision detecting jeans for checkng whether transmitted packets have collided against each other or not;

means for continuously sending out a dummy packet to a channel for a predetermined time after a circuit connection is made, delivering out a connection completion signal when the results of a check made by said collision detecting means indicates that the last dummy packet has not collided and again sending out a dummy packet to another channel for a predetermined time when said result indicates that a last dummy packet has collided;

means for retransmitting packets other than said dummy packet whose collision has been detected by said collision detecting means; and

a calculating circuit responsive to outputs of said carrier detecting means and said collision detecting means corresponding to responsive channels for updating a plurality of parameters stored in said memory circuit, whereby circuit switching and packet switching coexist.

4,594,707

HIGH SPEED LIMITED DISTANCE MULTIPLEXED DATA COMMUNICATIONS MODEM USING A SINGLE TWISTED PAIR OF CONDUCTORS

John W. Merritt, Austin; Henry Wurzburg, Round Rock, and Stephen H. Kelley, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 17, 1984, Ser. No. 650,945

Int. Cl.[4] H04J *3/00*

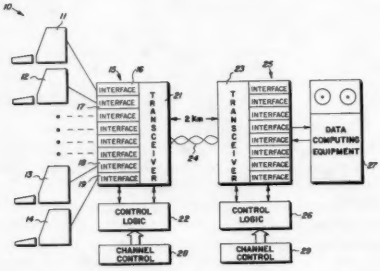
U.S. Cl. 370—91 **12 Claims**

1. In a data communication system for communicating data between a plurality of data sources and remote data communication equipment, each of the data sources having a data node for providing and receiving data asynchronously at a predetermined data rate, a multiplexed data communications modem, comprising:

transceiver means having a first data terminal for receiving data from the data sources in multiplexed form where data capacity of each data source is independent of data rate of all other data sources, a second data terminal for providing multiplexed data from the remote data communication

equipment, and a third data terminal for synchronously communicating data between the transceiver means and the remote communication data equipment;

control means coupled to the transceiver means, for providing first and second control signals of first and second frequencies, respectively, in response to an enable signal provided by the transceiver means, said first and second control signals selectively multiplexing and demultiplexing data between predetermined ones of the plurality of data sources and the transceiver means; and



a plurality of interface circuits, each of said interface circuits having a first terminal coupled to the data node of a predetermined data source for communicating data between the data source and interface circuit, a second terminal for synchronously providing data from the data source in response to the first control signal, and a third terminal for synchronosuly receiving data from the remote data communication equipment in response to the second control signal, said first and second frequencies of the first and second control signals determining the data capacity of the respective coupled data source.

4,594,708

SYNCHRONIZATION FOR A DIGITAL TRAIN INTENDED FOR A CORRECT FRAMING OF RECEIVED INFORMATION

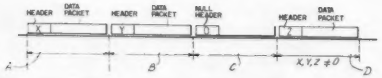
Michel Servel, Le Rhu en Servel, and Alain Thomas, Cosmos, Bâtiment E, both of 22300 Lannion, France

Filed Oct. 11, 1983, Ser. No. 540,790

Claims priority, application France, Oct. 21, 1982, 82 18123

Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—94 **13 Claims**



1. A process for a synchronization of a digital transmission system with a TDM multiplexed group of signals divided into equal and recurrent time intervals, said process comprising the steps of:

(a) transmitting the information divided into data packets, each data packet (A, B or D) having a time span which fills one of said time intervals and including a header (X, Y or Z) which has a fixed length and is followed by the data field.

(b) transmitting an interval synchronizing signal within each idle time interval (C), not carrying a data packet, said interval synchronizing signal having the length of a packet header and not being used as a packet header, and

(c) entirely filling the remaining part of the idle interval with a sequence of signals.

4,594,709

DATA TRANSMISSION DEVICE FOR LOOP TRANSMISSION SYSTEM

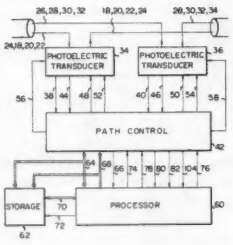
Kazuo Yasue, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 25, 1983, Ser. No. 526,305

Claims priority, application Japan, Aug. 25, 1982, 57-147203; Aug. 27, 1982, 57-148983; May 31, 1983, 58-95951; May 31, 1983, 58-95952

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—8 **12 Claims**



1. In a data transmission system for transmitting signals comprising clock and data signals in a sequential frame format, said system having a pair of transmission loops, one of which is an active loop and the other a back up loop having direction of signal propagation opposite to that of the active loop, and a plurality of data transmission devices, each of which is connected to the two transmission loops, each of said data transmission devices comprising:

detector means for detecting the absence of a clock signal from a received frame which is transmitted over the active loop;

generator means responsive to the detector means for generating a first signal when said detector means has detected the absence of a clock signal in a received frame transmitted on the active loop;

transmitter means for, after said generator means has generated said first signal, transmitting a second signal to a second data transmission device which is connected downstream on said active loop, said second signal indicating a failure in the active loop, and transmitting a third signal to a third transmission device which is connected downstream on said back up loop, said third signal being adapted to test the continuity of said back up loop without indicating a clock absence; and

selector means for switching both an input and an output of said device to the back up loop, when the third signal has been detected over the back up loop upon lapse of a predetermined period of time after the transmission of the second signal and the third signal, thereby using the back up loop as the active loop.

4,594,710

DATA PROCESSING SYSTEM FOR PREVENTING MACHINE STOPPAGE DUE TO AN ERROR IN A COPY REGISTER

Fumirou Matsunoshita, and Kiyosumi Sato, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 15, 1983, Ser. No. 561,965

Claims priority, application Japan, Dec. 25, 1982, 57-231867

Int. Cl.[4] G06F *15/16*

U.S. Cl. 371—16 **4 Claims**

1. A data processing system comprising:

an instruction control unit for controlling system operation;

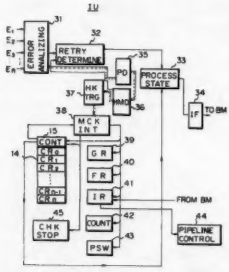
a storage control unit, operatively connected to said instruction control unit, for storing data used for the system operation; and

machine check interruption means, operatively connected to said instruction control unit, for carrying out a machine

check interruption when an error occurs during the system operation;

said instruction control unit having a system control register group for storing system control data;

said storage control unit having a copy register group for storing data copies from said system control data;



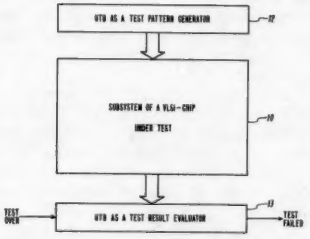
said instruction control unit further comprising register save state means, operatively connected to said system control register group and said copy register group, for copying the contents stored in said system control register group into said copy register group during the machine check interruption when an error occurs in said copy register group during the system operation.

4,594,711

UNIVERSAL TESTING CIRCUIT AND METHOD

Satish M. Thatte, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 10, 1983, Ser. No. 551,667
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—25 **8 Claims**



1. A test circuit for on-chip testing of a VLSI subsystem, comprising:

a test generator on said VLSI chip for applying a predetermined test pattern to an input channel of said subsystem, wherein said test generator is configurable to function as a latch, a psuedorandom pattern generator for generating pseudorandom test patterns, and a counter to generate a test pattern in accordance with a binary up count, and wherein said test generator is configured to function as one of the configurable functions in accordance with the state of a mode controlling control input to said test generator; and

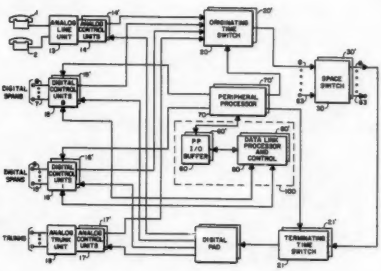
a test evaluator on said VLSI chip for receiving output signals from said subsystem, wherein said test evaluator is configurable to function as a latch and a parallel signature analyzer, wherein said test evaluator is configured to function as one of the configurable functions in accordance with the state of a second mode controlling control input to said test evaluator.

4,594,712

REMOTE DATA LINK TRANSMIT DATA FORMATTER

Thomas J. Perry, Phoenix, and Muhammad I. Khera, Glendale, both of Ariz., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Dec. 22, 1983, Ser. No. 564,133
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—49 **6 Claims**



1. In a telecommunications switching system, a transmit data formatter for assembling a plurality of 8-bit data bytes into a data message containing a plurality of message bytes, each message byte having seven data bits and a parity bit, said telecommunications switching system including a peripheral processor, an output buffer arranged to receive and store said 8-bit data bytes from said peripheral processor and a temporary memory, said transmit data formatter comprising:

a receive buffer connected to said output buffer arranged to receive and store in parallel form a data byte from said output buffer when said receive buffer is empty;

a parallel to serial converter connected to said receive buffer arranged to receive said data byte from said receive buffer and output said data byte serially;

a serial to parallel converter connected to said parallel to serial converter output arranged to receive said serial data, said serial to parallel converter assembling said serial data into a partial message byte after seven data bits has been input by said serial to parallel converter; and

a horizontal parity generator connected to the output of said parallel to serial converter arranged to receive said serial data, and develop and append to said partial message byte a parity bit after seven data bits has been input to said horizontal parity generator, forming said message byte, whereby said message byte is transferred to said temporary memory.

4,594,713

REMOTE DATA LINK RECEIVE DATA REFORMATTER

Thomas J. Perry, Phoenix, and Muhammad I. Khera, Glendale, both of Ariz., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Dec. 22, 1983, Ser. No. 564,135
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—49 **8 Claims**

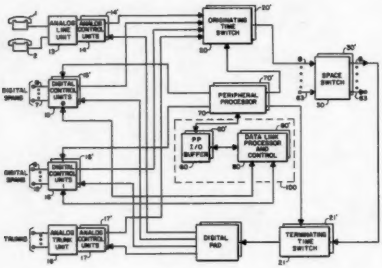
1. In a telecommunications switching system, a receive data reformatter for disassembling a data message containing a plurality of message bytes, each message byte having seven data bits and a parity bit into a plurality of 8-bit data bytes, said telecommunications switching system including a peripheral processor, connected an input buffer, said input buffer arranged to receive and store said 8-bit data bytes from said receive data reformatter and a temporary memory, said receive data reformatter comprising:

a parallel to serial converter connected to said temporary memory arranged to receive a message byte from said

temporary memory in parallel form and output said message byte serially;

a horizontal parity check circuit connected to said parallel to serial converter output arranged to receive said parallel to serial converter serial message byte and output an error signal to said peripheral processor responsive to an error in parity;

a serial to parallel converter connected to said parallel to serial converter serial output arranged to receive the



output serial message byte from parallel to serial converter and assemble said serial message byte into parallel form; and

a write buffer connected to said serial to parallel converter output arranged to receive a parallel data byte when eight data bits have been assembled in said serial to parallel converter whereby, said write buffer transfers said data byte to said input buffer making said data byte available to said peripheral processor.

4,594,714

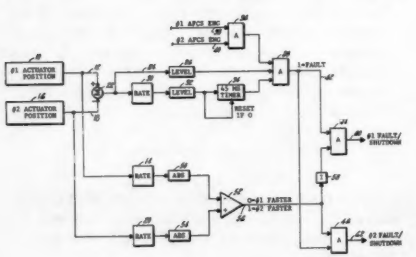
DUAL-ACTUATOR MONITOR

William C. Fischer, Monroe; David J. Verzella, Guilford, and Stuart C. Wright, Milford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1983, Ser. No. 490,645

Int. Cl.[4] G05D *1/00*; G06F *11/30*

U.S. Cl. 371—62 **2 Claims**



2. A dual actuator monitor for use with a positioning system that has a first actuator and a second actuator for positioning a mechanism, that comprises:

a first position sensor for providing a first position signal indicative of the position of the first actuator;

a second position sensor for providing a second position signal indicative of the position of the second actuator; and

signal processing means, connected for response to the first position sensor and the second position sensor, for providing a first rate signal indicative of the absolute rate of the first actuator, for providing a second rate signal indicative of the absolute rate of the second actuator, for providing a position discrepancy signal when the difference in actuator position indicated by the first position signal and the second position signal exceeds a threshold, for providing a rate discrepancy signal in response to the first position signal and the second position signal indicating a relative change in positions between the first actuator and the second actuator in excess of a threshold that is sustained for more than a reference time interval, for indicating a first actuator fault when the position discrepancy signal and the rate discrepancy signal are present and the first rate signal is greater than the second rate signal, and for indicating a second actuator fault when the position discrepancy signal and the rate discrepancy signal are present and the second rate signal is greater than the first rate signal.

4,594,715

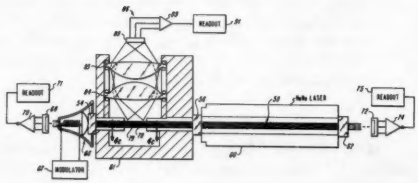
LASER WITH STABILIZED EXTERNAL PASSIVE CAVITY

Robert G. Knollenberg, Boulder, Colo., assignor to Particle Measuring Systems, Inc., Boulder, Colo.

Filed Nov. 17, 1983, Ser. No. 552,689

Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—32 **22 Claims**



1. A stabilized laser device, comprising:

laser beam generating means having an elongated body means terminated at opposite ends by first and second beam shaping elements to form an active cavity, said first beam shaping element transmitting a laser beam within said active cavity in a predetermined direction from said active cavity;

an external beam shaping element spaced from said active cavity and positioned in the path of said laser beam transmitted from said active cavity, said external beam shaping element and said first beam shaping element defining a passive cavity therebetween; and

modulating means connected with said external beam shaping element to oscillate said external beam shaping element to thereby stabilize said passive cavity.

4,594,716

CONDUCTION COOLED SOLID STATE LASER

Steve Guch, Jr., Saratoga, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 695,764, Jan. 28, 1985, which is a continuation-in-part of Ser. No. 555,750, Nov. 28, 1983, abandoned, which is a continuation of Ser. No. 319,838, Nov. 9, 1981, Pat. No. 4,429,394. This application Sep. 12, 1985, Ser. No. 775,088

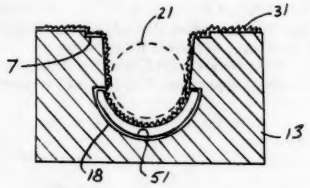
Int. Cl.[4] H01S *3/045*

U.S. Cl. 372—35 **1 Claim**

1. In a laser assembly having a cylindrically shaped pump lamp and a laser crystal rod, apparatus for conductively cooling the laser crystal and pump lamp comprising:

an elongated housing constituting a heat sink having an elongated cavity and comprising first and second sections for enclosing said laser crystal and said pump lamp respectively, said lamp and said crystal being disposed within said housing cavity adjacent to said housing;

thin optically reflective thermally conductive layers tightly wrapped around remotely opposed portions of the exterior surfaces, respectively, of said lamp and said crystal between said surfaces and adjacent portions of said housing such that the energy from said lamp is transmitted to said crystal, and



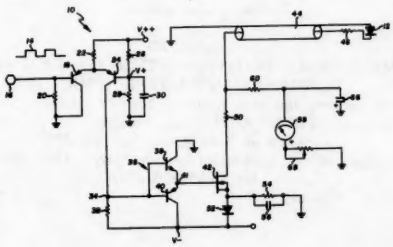
self-contained sealed enclosures of thermally conductive fluid separating said conductive layers, respectively, from said housing and engaging substantial portions of said conductive layers, respectively, and said housing, thereby enabling heat from said lamp and said crystal to be transmitted through said conductive layers and said fluid to said housing.

4,594,717

DRIVER CIRCUIT FOR LASER DIODE

Roger R. Bracht, Colorado Springs, and Dorrel R. Silvey, Elbert, both of Colo., assignors to Optical Storage International-U.S., Minneapolis, Minn.

Filed Mar. 27, 1984, Ser. No. 593,779
Int. Cl.[4] H01S 3/10
U.S. Cl. 372—38 **11 Claims**



1. A driver circuit for controlling a laser diode in response to a digital input signal, said driver circuit including:

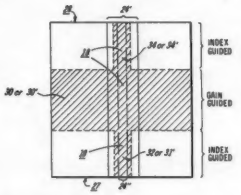
a switching means for receiving a digital input signal, said digital signal having a high voltage level and a low voltage level, said switching means generating a switching means output comprising a first switching voltage level in response to said high level and a second switching voltage level responsive to said low level; an emitter follower means having as its input said switching means output and generating an emitter follower output comprising a first follower output voltage level in response to said first switching voltage level and a second follower output voltage level in response to said second switching voltage level; a VMOS field effect transistor having a gate connected to said emitter follower means whereby the voltage level at said gate is substantially equal to the voltage level of said emitter follower output, and having a source biased to a pre-selected source voltage, said field effect transistor enabled whenever the voltage level at said gate is substantially greater than said source voltage, and disabled when the voltage level at said gate is not substantially greater than said source voltage, one of said first and second follower output voltage levels being substantially greater than said source voltage and the other of said follower output voltage levels being no greater than a voltage level near said source voltage; and a laser diode connected in series with said field effect transistor and emitting light whenever said field effect transistor is enabled.

4,594,718

COMBINATION INDEX/GAIN GUIDED SEMICONDUCTOR LASERS

Donald R. Scifres, Los Altos; William Streifer, and Robert D. Burnham, both of Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 1, 1983, Ser. No. 462,840
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—45 **15 Claims**



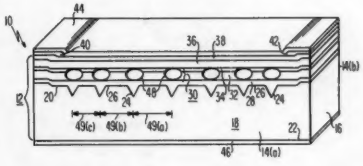
1. In a semiconductor laser comprising a plurality of contiguous semiconductor layers deposited on a substrate, one or more of said layers forming an active region, said active region permitting carrier recombination and iight generation in at least one portion thereof and supporting radiation propagatingunder lasing conditions in an optical cavity established between end facets of the laser, said active region characterized by having in combination at least one index guiding region and at least one gain guiding region integrally coupled to one another relative within said optical cavity.

4,594,719

PHASE-LOCKED LASER ARRAY HAVING A NON-UNIFORM SPACING BETWEEN LASING REGIONS

Donald E. Ackley, West Amwell Township, Hunterdon County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 19, 1984, Ser. No. 572,113
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—50 **11 Claims**



1. In a phase-locked laser array including a body of semiconductor material having therein a cavity region and means for defining a plurality of substantially parallel lasing regions in the cavity region which have uniform widths in the lateral direction and which are spaced an effective distance apart so that the modes of oscillation in the different lasing regions are phase-locked to one another;

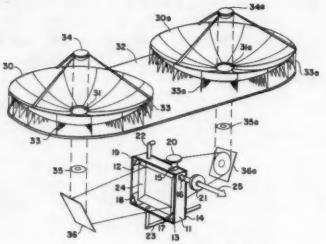
the improvement wherein the center-to-center spacing between the lasing regions in the lateral direction varies monotonically.

4,594,720

LONG GAIN LENGTH SOLAR PUMPED BOX LASER

Russell J. DeYoung, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 18, 1985, Ser. No. 745,973
Int. Cl.[4] H01S 3/091
U.S. Cl. 372—79 16 Claims



6. A solar pumped laser with increased efficiency comprising:

means for providing a lasing path with a loop in the path;

means for collecting solar radiation;

means for concentrating the collected solar radiation into donut shaped intensity pattern; and

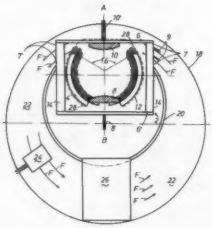
means for directing the concentrated solar radiation pattern into said lasing path such that there is a fit between said loop and said donut shaped intensity pattern.

4,594,721

CORONA DISCHARGE PREIONIZED HIGH PULSE REPETITION FREQUENCY LASER

Eugenio Penco, and Gianemilio Salvetti, both of Rome, Italy, assignors to Enea-Comitato Nazionale per la Ricerca e lo Sviluppo dell'Energia Nucleare e dell'Energie Alternative and Selenia - Industrie Elettroniche Associate S.p.A., both of Rome, Italy

Filed Dec. 28, 1984, Ser. No. 687,030
Claims priority, application Italy, Dec. 29, 1983, 49601 A/83
Int. Cl.[4] H01S 3/097
U.S. Cl. 372—88 6 Claims



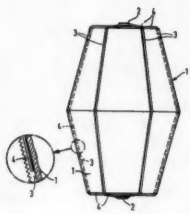
1. A pulsed gas laser with UV preionization by corona discharge including: a first electrode of a pair between which a laser discharge takes place, said first electrode being located in front of a longitudinal aperture having a wall of a C shaped channel of dielectric material with substantially constant thickness, said first electrode being located outside of said C shaped channel; a second electrode of said pair being located along the bottom of said channel; a conducting grid connected to said first electrode extending from said first electrode over both sides of said channel to a position at an edge of said second electrode at the inside of said channel; said laser having means for replacing, after each discharge the laser gas at least three times within the lapse of time between two successive laser discharges.

4,594,722

GRAPHITE ELECTRODE FOR ARC FURNACES AND METHOD FOR MANUFACTURING SAME

Horst Böder, Bilberbach, Fed. Rep. of Germany, assignor to Sigri GmbH, Augsburg, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,572
Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3418934
Int. Cl.[4] H05B 7/14
U.S. Cl. 373—91 28 Claims



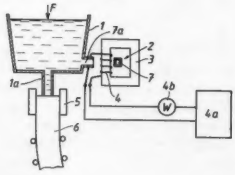
1. Graphite electrode for arc furnaces composed of electrode graphite parts comprising a plurality of graphite electrode sections connected by threaded graphite nipples, with at least one electrode graphite part having a plurality of graphite filament yarn stretched around and tensionally connected to the electrode part.

4,594,723

METHOD FOR PROVIDING PINCH CONTROL OF A TUNDISH CHANNEL-TYPE INDUCTOR

Kare Folgero, and Sten Kollberg, both of Västerås, Sweden, assignors to ASEA AB, Västerås, Sweden

Filed Mar. 5, 1984, Ser. No. 586,261
Claims priority, application Sweden, Mar. 7, 1983, 8301225
Int. Cl.[4] H05B 5/00
U.S. Cl. 373—142 2 Claims



1. A method for continuously pouring molten metal in an initially substantially unfilled tundish having a channel-type inductor having a channel opening into the bottom portion of the tundish, comprising starting the pouring and while continuously pouring the sequential steps of applying power to the inductor when its channel is first covered by the pouring metal to form a metal level and the static pressure of the metal is low and while increasing the power rapidly so as to cause incipient pinching in the channel and then momentarily rapidly reducing the power so as to prevent pinching; as the metal level further increases so that the metal's static pressure further increases, again increasing the power rapidly so as to again cause incipient pinching in the channel and then again momentarily rap-

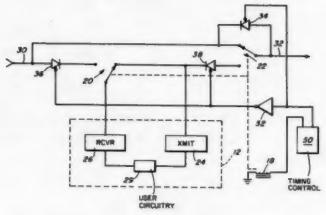
idly reducing the power so as to prevent pinching; and continuing the sequential steps until the tundish is filled.

4,594,724

BYPASS METHOD AND APPARATUS FOR DEBOUNCING A MECHANICAL SWITCHING ELEMENT IN A DATA COMMUNICATIONS NETWORK

Thomas C. Hogan, Natick, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Filed Feb. 10, 1984, Ser. No. 579,094
Int. Cl.[4] H04B *1/38*
U.S. Cl. 375—7 **16 Claims**



1. Apparatus for connecting a node to and disconnecting said node from a high speed data communications network comprising

a mechanical switching element having an activated state and a deactivated state, said mechanical element having contacts for connecting, in said activated state, said node to said communications network and for disconnecting, in said deactivated state, said node from said communications network,

a first high speed solid state switching means having a high impedance state and a low impedance state, said switch means being connected to at least two of said mechanical contacts for bypassing said node in said low impedance state,

a second high speed solid state switching means having a high impedance state and a low impedance state, said second switching means being connected in series with at least one mechanical element contact for isolating said node from said communications network,

means for operating said mechanical element and said first and second solid state switching means in timed sequence to substantially minimize the effect of mechanical contact bounce of the communication of data on said network.

4,594,725

COMBINED ADAPTIVE EQUALIZATION AND DEMODULATION CIRCUIT

Lydie Desperben, Joinville; Hikmet Sari, Creteil; Saïd Moridi, Paris, and Georges Bonnerot, Les Ulis, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 28, 1984, Ser. No. 608,060
Claims priority, application France, May 11, 1983, 83 07910
Int. Cl.[4] H04B *3/14*
U.S. Cl. 375—15 **6 Claims**

1. An adaptive equalizer arrangement for a digital transmission system, characterized in that it comprises:

(1) a first in-phase path provided at the output of the transmission channel of the system and whose structure is that of a transversal filter having n branches and (n−1) delay circuits between the n inputs of these branches, each of these n branches comprising, arranged in series:

(a) a mixer;

(b) a lowpass filter;

(c) a multiplier;

the outputs of these n branches being connected to means for deciding the symbols $\hat{a}_k$ to be transmitted from the output of this in-phase path and of the arrangement;

(2) arranged in parallel with this first path, a second quadrature path which also has the structure of a transversal filter having n branches and (n−1) delay circuits between the n inputs of these branches, each of these n branches comprising, arranged in series:

(d) a mixer;

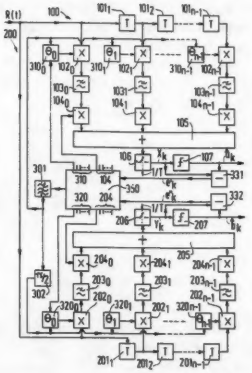
(e) a lowpass filter;

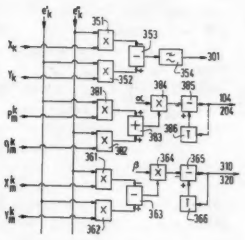
(f) a multiplier;

the outputs of these n branches being connected to means for deciding the symbols $\hat{b}_k$ to be transmitted from the output of this quadrature path and of the arrangement; the multipliers of these first and second paths being placed in each branch either at the head, before the corresponding mixers, or at the output of the lowpass filters;

(3) a third control path comprising:

(g) two subtracting circuits for determining the differences e'_k and e''_k between the signals before decision, X_k and Y_k, and after decision, $\hat{a}_k$ and $\hat{b}_k$, expressed for the in-phase path and for the quadrature path by the respective expressions:





$$e'_k = X_k - \hat{a}_k \text{ (where } X_k = X(t)_{t=kt+t_0}\text{)}$$

and

$$e''_k = Y_i - \hat{b}_k \text{ (where } Y_k = Y(t)_{t=kT+t_0}\text{)}$$

where X(t) and Y(t) are the output signals of the transversal filter of the in-phase path and the quadrature path, respectively, and t_0 is the sampling instant;

(h) a voltage-controlled oscillator producing a signal of the type $\sin(\omega_0 t+\phi)$ where ω_0 corresponds to the frequency of the carrier, which oscillator is controlled by the signal

$\epsilon_k = e'_k Y_k - e''_k X_k$

(i) at the output of this oscillator, n first parallel-ranged phase shifters whose outputs apply to the respective n second inputs of the mixers in the in-phase path a demodulation signal of the type sin $(\omega_o t + \phi\theta_m)$ where θ_m is the phase shift for the $(m+1)^{st}$ branch and m varies from o to $(n-1)$;

(j) also at the output of the voltage-controlled oscillator, a $\pi/2$ phase shifter followed by n second parallel-arranged phase shifters whose outputs apply to the n second inputs of the mixers in the quadrature path a demodulation signal of the type cos $(\omega_o t + \phi + \theta_m)$;

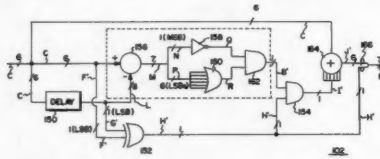
(k) a control circuit for the voltage-controlled oscillator, the 2n phase shifters and the 2n multipliers.

4,594,726

DEDITHERING CIRCUITRY IN DIGITAL TV RECEIVER

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 29, 1984, Ser. No. 676,142
Int. Cl.[4] H04N *9/32, 9/50*
U.S. Cl. 375—26 **14 Claims**



13. In a digital signal processing system including a source of digital signal samples which were reduced in sample bit size by adding a dither signal to the signal samples and truncating the least significant bit of the sample sums, apparatus for dedithering signal samples comprising:

means responsive to dithered signal samples for comparing the least significant bits of successive dithered signal samples, said means producing a bilevel signal having a first state when the least significant bits of successive samples have like values and a second state when the least significant bits have differing values;

means responsive to said dither signal, said bilevel signal and said dithered signal samples for decrementing said dithered signal samples by a unit value when the dither signal is a logical 1 and the value of the least significant bits of current dithered signal sample and the preceding dithered signal sample differ; and

means for concatenating the bilevel signal, as the least significant bit, to samples produced by said means for decrementing said dithered signal, which concatenated samples correspond to dedithered signal.

4,594,727

SYNCHRONOUS RECEIVER

O. Leon Pierce, Huntsville, Ala., assignor to Universal Data Systems, Huntsville, Ala.

Filed Jan. 5, 1983, Ser. No. 455,855
Int. Cl.[4] H04L *27/22*
U.S. Cl. 375—83 **21 Claims**

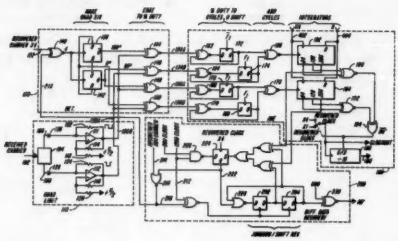
1. A synchronous receiver including:

means for receiving a carrier signal comprising a phase-shift modulated signal with binary data having a baud rate:

carrier recovery means providing a recovered carrier signal;

absolute phase comparison means providing an absolute phase output signal related to said binary data and measured by the phase difference between the received phase-shift modulated signal and said recovered carrier signal, comprising:

a multiple sample means providing a plurality of sampled absolute phase signals; and



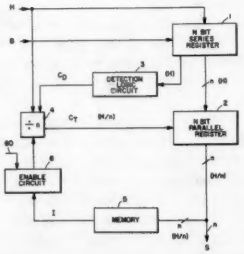
sample average means providing said absolute phase output according to an average of said sampled absolute phase signals.

4,594,728

SYNCHRONIZATION DEVICE FOR DIGITAL FRAME TRANSMISSION

Maurice Niquel; Claude Gourdon, both of Perros Guirec, and Jean Rouxel, Lannion, all of France, assignors to Lignes Telegraphiques et Telephoniques LTT, Honorine, France

Filed Jun. 26, 1984, Ser. No. 624,718
Claims priority, application France, Jul. 12, 1983, 83 11614
Int. Cl.[4] H04L *7/04*
U.S. Cl. 375—116 **8 Claims**



1. A synchronization device for digital transmission of data with frames, the data transmitted being received in series in binary form and comprising a synchronization signal having a total number p of bits, the device further receiving a clock signal (H), representing the line frequency of the transmission, said device comprising

a series register with n positions, receiving said binary data;

a parallel register with n positions, receiving in parallel the contents of said series register when triggered by said clock signal (H);

a logic circuit connected to an output of said series register and ensuring detection of a first m bits of said total number p of bits of said synchronization signal and delivering a recognition signal when said m bits are detected;

a divider dividing said clock signal by n, said divider being controlled by said recognition signal (C_D);

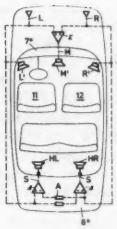
a memory, receiving in parallel the contents of said parallel register when said contents are released therefrom under control (C_T) of said divider, said memory ensuring recognition of said synchronization signal by words of n bits and supplying a signal (I) inhibiting the operation of said divider when said synchronization signal is not recognized.

4,594,729

METHOD OF AND APPARATUS FOR THE STEREOPHONIC REPRODUCTION OF SOUND IN A MOTOR VEHICLE

Bernhard Weingartner, Feldkirch-Vorarlberg, Austria, assignor to Neutrik Aktiengesellschaft, Schaan, Liechtenstein

Filed Apr. 20, 1983, Ser. No. 486,701
Claims priority, application Austria, Apr. 20, 1982, 1543/82
Int. Cl.[4] H04B *1/00;* H04R *5/00*
U.S. Cl. 381—18 6 Claims



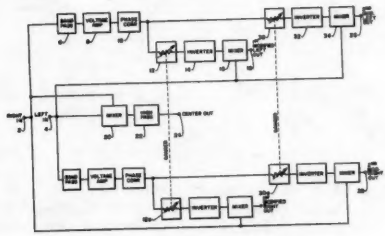
1. Stereophonic reproduction system for the passenger space in a motor vehicle, such as a passenger vehicle having a front end region forwardly of the driver and a rear end region behind the passenger space with a central longitudinal axis dividing the passenger space between the front end region and the rear end region, the front end region and the rear end region each having a left side and a right side located on opposite sides of the central longitudinal axis, comprising at least one of a receiving device and a reproduction device, and a plurality of speakers, at least two of said speakers spaced laterally from one another in the front end region of the passenger space forwardly of the seats in the passenger space and arranged so that one of the two said speakers is located on the left side and reproduces the left signal of a recorded sound and directs it into the passenger space and the other one of the two said speakers is located on the right side and reproduces the right signal and directs it into the passenger space, a third speaker located approximately on the central longitudinal axis between the at least two of said speakers in the front end region of the passenger space and in the front of the seats in the passenger space, means for supplying said third speaker with an electrical summation signal of the left and right signals, and at least one rear speaker located in the rear end region of the passenger space behind the seats in the passenger space, and means for supplying the electrical differential signal ($S=L-R$ and $S=R-L$, respectively) of said right and left signals to said at least one rear speaker, at least two said rear speakers are located in the rear end region and spaced laterally apart with one said rear speaker located on the left side and another said rear speaker located on the right side of the rear end region, said means for supplying the electrical differential signal supplies the differential signal to said left side and right side rear speakers and the differential signal for said left side rear speaker has the portion of the differential signal from the left signal stronger than the portion of the signal from the right signal and the differential signal for said right side rear speaker has the portion of the differential signal from the right signal stronger than the portion of the left signal.

4,594,730

APPARATUS AND METHOD FOR ENHANCING THE PERCEIVED SOUND IMAGE OF A SOUND SIGNAL BY SOURCE LOCALIZATION

Terry K. Rosen, 1314 S. Roxbury Dr., No. 2, Los Angeles, Calif. 90035

Filed Apr. 18, 1984, Ser. No. 601,661
Int. Cl.[4] H04R *5/00*
U.S. Cl. 381—27 15 Claims

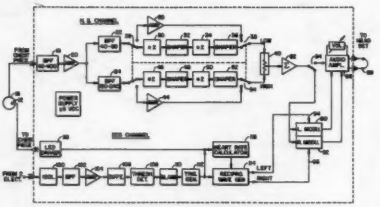


1. An apparatus for enhancing the perceived sound image of a stereophonic, audio reproduction system whose inputs are a right and a left signal channels, and whose outputs are a modified right, a modified left and a centersignal channels, comprising: first and second input terminals to which the right and left signal channels are respectively applied; a first modified right, a first modified left and center output terminals; first band pass means connected to said first input terminal for attenuating signal frequencies ouside of a selected predetermined bandwidth; first phase correction means connected to the first band pass means for shifting the phase of the signal output from the first band pass means to maintain phase integrity with the left signal channel; first voltage control means connected to the first phase correction means for selectively controlling the amplitude of the signal output from the first phase correction means; first inverter means connected to the first control means for inverting the signal output from the first control means; first mixer means connected to the first inverter means and to the second input terminal and to the first modified left output terminal for applying a composite modified left signal channel formed by combining the signal output from the first inverter means and the left signal channel and applying the output signal to the first modified left output terminal; second band pass means connected to the second input terminal for attenuating signal frequencies outside of said selected predetermined bandwidth; second phase correction means connected to the second band pass means for shifting the phase of the signal output from the second band pass means to maintain phase integrity with the right signal channel; second control means connected to the second phase correction means for selectively controlling the amplitude of the signal output from the second phase correction means; second inverter means connected to the second control means for inverting the signal output from the second control means; second mixer means connected to the second inverter means and to the first input terminal and to the first modified right output terminal for applying a composite modified right signal channel formed by combining the signal output from the second inverter means and the right signal channel to the first modified right output terminal; center mixer means connected to the first and to the second input terminals for combining the right and left signal channels, respectively; high pass filter means connected to the center mixer means and to the center output terminal for attenuating the signal output of the center mixer means below a selected predetermined center cutoff frequency and applying the output signal to the center output terminal.

4,594,731
ELECTRONIC STETHOSCOPE

Shlomo Lewkowicz, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Nov. 9, 1984, Ser. No. 670,475
Int. Cl.[4] A61B 7/04
U.S. Cl. 381—67 **16 Claims**



1. An electronic stethoscope comprising

a phonocardio transducer for converting physical vibrations into corresponding alternating current electrical signals,

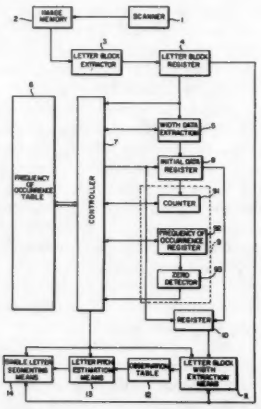
frequency multiplier means for multiplying the frequency of said signals by a predetermined number and,

reproducer means supplied with said frequency multiplied signals for audibly reproducing said frequency multiplied signals.

4,594,732
LETTER PITCH DETECTION SYSTEM

Yoshitake Tsuji, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,130
Claims priority, application Japan, Mar. 1, 1983, 58-33068; Mar. 1, 1983, 58-33076
Int. Cl.[4] G06K 9/46
U.S. Cl. 382—9 **14 Claims**



1. A letter pitch detection system for scanning a series of aligned letter images on a paper surface to extract a letter pitch for separating said series of aligned letter images into one-letter units, said system comprising:

means for successively extracting letter blocks from said series of aligned letter images, and for determining location, width, height and frequency of occurrence information with respect to the width for each of said letter blocks;

effective interval detection means for detecting an interval of one-letter width which is effective for estimating said letter pitch, based on a mean height of said plurality of letter blocks and said frequencies of occurrence of said plurality of letter blocks;

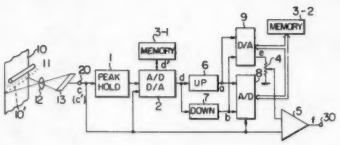
letter block width extraction means for detecting letter blocks which, based on said effective interval and a permissible space width, comprise a plurality of series of one-letter blocks, and for calculating a sum of the number of letters in each of said series of letter blocks, the widths of said letter blocks, and a space width between adjacent letter blocks; and

letter pitch estimation means for estimating the letter pitch based on the sum of each of said numbers of letters and the number of said sum.

4,594,733
SIGNAL PROCESSING SYSTEM AND THE METHOD

Minoru Kanzaki; Kazumi Komiya, both of Yokosuka; Masaharu Tadauchi; Kunio Sato, both of Hitachi, and Kiyohiko Tanno, Katsuta, all of Japan, assignors to Nippon Telegraph & Telephone Hitachi Ltd & Public Corporation, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,368
Claims priority, application Japan, Apr. 2, 1982, 57-53807
Int. Cl.[4] G06H 9/38
U.S. Cl. 382—50 **15 Claims**



1. A signal processing system for digitizing analog scan signals obtained by line-by-line scanning of a document for information, said analog scan signals for each scan line having a shading of variable voltage level and substantially the same profile, comprising:

input terminal means for inputting an analog scan signal;

a first digital memory;

first means for detecting said analog scan signal for an information-blank scanning line, for analog-to-digital converting the detected analog scan signal and for storing said converted signal in said first digital memory in digital form, said detecting being responsive only to a rate of voltage change (dv/dt) of said analog signal which is no larger than a predetermined value, and including output means for supplying an analog output based on said stored digital signal by digital to analog conversion of said stored digital signal; and

second means for generating signals identifying a voltage range having a range width smaller than the magnitude of said variable voltage level in response to the analog output of said first means, including means for generating a first voltage higher by a predetermined amount than the analog voltage outputted from said first means and means for generating a second voltage lower by a predetermined amount than the analog voltage outputted by said first means;

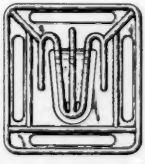
third means for detecting which of a plurality of voltage levels within the voltage range between said first and second voltages corresponds to an analog scan signal received at said input terminal means and for storing said detected voltage level in digital form;

fourth means for outputting an analog value within sid voltage range on the basis of the detected and stored digital voltage level and for producing at least a threshold level signal on the basis of said outputted analog value; and

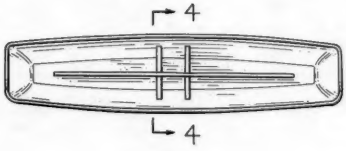
fifth mean for digitizing an analog scan signal applied to said input terminal means with reference to said threshold level signal.

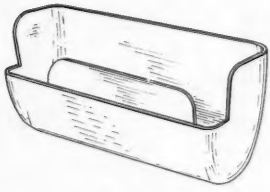
284,132
RECTANGULAR DOUBLE DONUT
David M. Larson, 2550 NE. 36th Ave., Portland, Oreg. 97212
Filed Aug. 1, 1983, Ser. No. 519,378
Term of patent 14 years
U.S. Cl. D1—120

284,133
HARNESS HOOK FOR A SAILBOARD
Warwick P. Freeland, Victoria, Australia, assignor to W. A. Deutsher Proprietary Limited, Moorabbin, Australia
Filed Jan. 6, 1983, Ser. No. 456,148
Term of patent 14 years
U.S. Cl. D2—408

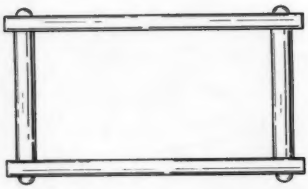


284,134
INSERT FOR AN EYEGLASS CASE
Ronald Scoppettone, 25 Redfearn La., Alamo, Calif. 94507
Filed Jan. 23, 1984, Ser. No. 573,310
Term of patent 14 years
U.S. Cl. D3—34

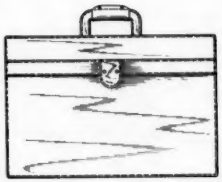


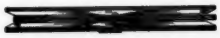


284,135
GOLF BAG CLUB DIVIDER
Harry R. Wilson, and Beverly A. Wilson, both of 2242 Spruce Dr., Brainerd, Minn. 56401
Filed Sep. 28, 1983, Ser. No. 536,622
Term of patent 14 years
U.S. Cl. D3—37

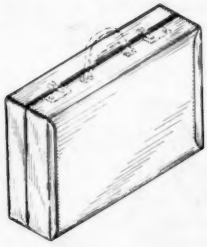


284,136
EXECUTIVE CASE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Lenox, Inc., Lawrenceville, N.J.
Filed May 19, 1983, Ser. No. 495,965
Term of patent 14 years
U.S. Cl. D3—71

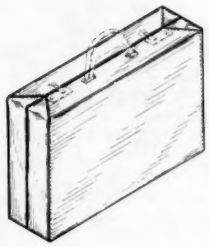




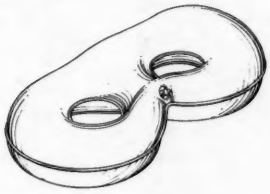
284,137
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Apr. 26, 1983, Ser. No. 488,640
Term of patent 14 years
U.S. Cl. D3—76



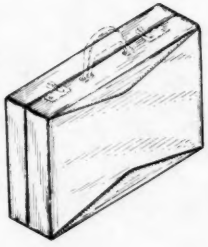
284,138
LUGGAGE CASE
Hyun S. Kim, Ellwood City, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Apr. 26, 1983, Ser. No. 488,798
Term of patent 14 years
U.S. Cl. D3—76



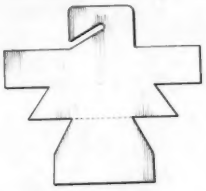
284,139
INFLATABLE CUSHION OR SIMILAR ARTICLE
Sammy S. Ko, 124-34 Non Hyeon Dong Kang Nam-Ku, Seoul, Rep. of Korea
Filed Mar. 4, 1983, Ser. No. 472,268
Claims priority, application Rep. of Korea, Sep. 27, 1982, 82-8539[U]; Jan. 14, 1983, 83-358[U]
Term of patent 14 years
U.S. Cl. D6—604



284,140
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Apr. 26, 1983, Ser. No. 488,638
Term of patent 14 years
U.S. Cl. D3—76



284,141
CLOTHING HANGER OR SIMILAR ARTICLE
Alfred C. Jeffrey, R.R. 1, Box 215, Denver, Ind. 46926
Filed Dec. 4, 1984, Ser. No. 678,086
Term of patent 14 years
U.S. Cl. D6—316

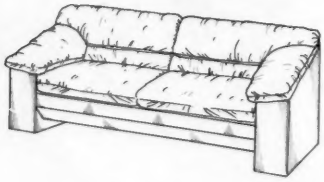


284,142
SEAT
William B. Raftery, Arlington, Tex., assignor to Steelcase, Inc., Grand Rapids, Mich.
Filed May 13, 1983, Ser. No. 494,299
Term of patent 14 years
U.S. Cl. D6—334

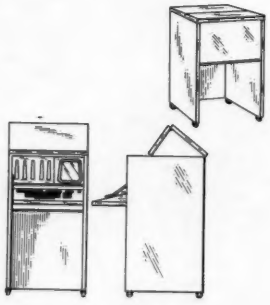
284,143
CHAISE
Robert D. Vanderminden, Granville, N.Y., assignor to The Telescope Folding Furniture Co., Inc., Granville, N.Y.
Filed Mar. 31, 1983, Ser. No. 480,802
The portion of the term of this patent subsequent to Oct. 22, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—361

284,144
COMBINED SEAT AND BACKREST
Hugo Pedersen, Kristineholmsvagen 12, 441 39 Alingsas, Sweden
Filed Feb. 22, 1983, Ser. No. 468,863
Claims priority, application Sweden, Aug. 31, 1982, 82-2080
The portion of the term of this patent subsequent to Aug. 13, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—374

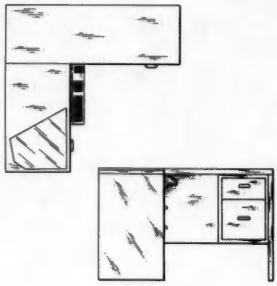
284,145
SOFA
Thomas A. Staats; Robert A. Smitherman, and William E. Hoover, all of Salisbury, N.C., assignors to Carter Industries, Inc., Salisbury, N.C.
Filed Jan. 7, 1985, Ser. No. 689,590
Term of patent 14 years
U.S. Cl. D6—381

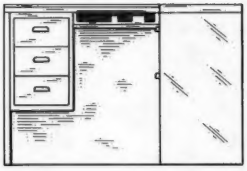


284,146
DESK WITH BUILT IN COMPUTER CONSOLE
Arnold Gordon, 536 Mill Pond Dr., San Jose, Calif. 95125
Division of Ser. No. 356,057, Mar. 8, 1982, Pat. No. Des. 278,956.
This application May 23, 1985, Ser. No. 737,804
Term of patent 14 years
U.S. Cl. D6—425

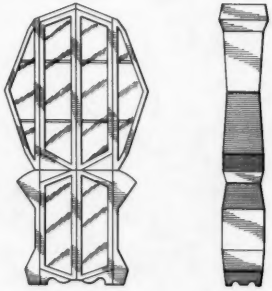


284,147
DESK WITH BUILT IN COMPUTER CONSOLE
Arnold Gordon, 536 Mill Pond Dr., San Jose, Calif. 95125
Division of Ser. No. 356,057, Mar. 8, 1982, Pat. No. Des. 278,956.
This application May 23, 1985, Ser. No. 737,805
Term of patent 14 years
U.S. Cl. D6—427

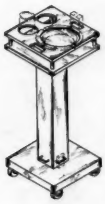




284,148
CHINA CABINET OR THE LIKE
Donnie K. Robinson, 6613 Pow Hatan St., Riverdale, Md. 20737
Filed Jul. 27, 1983, Ser. No. 517,425
Term of patent 14 years
U.S. Cl. D6—436

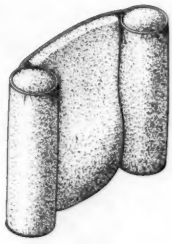


284,149
SUPPORT STAND FOR CARD PLAYERS' ACCESSORIES
Richard L. Rose, 3605 E. 144th St., Cleveland, Ohio 44120
Filed Sep. 15, 1983, Ser. No. 532,469
Term of patent 14 years
U.S. Cl. D6—467



284,150
CHAIR BASE
Donald C. Petitt, 207 W. 86th St., New York, N.Y. 10024
Division of Ser. No. 320,038, Nov. 10, 1981. This application May 6, 1983, Ser. No. 492,289
The portion of the term of this patent subsequent to Aug. 21, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—498

284,151
SUPPORT CUSHION
Violet M. Johnson, 21 Kelly Cir., Katonah, N.Y. 10536
Filed Sep. 7, 1983, Ser. No. 530,149
Term of patent 14 years
U.S. Cl. D6—596



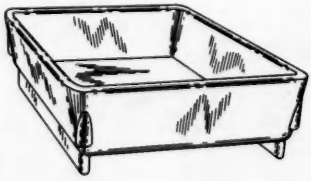
284,152
PAPER HOLDER
Lars Jerhammar, Norrköping, Sweden, assignor to Palm AG, Zurich, Switzerland
Filed Apr. 13, 1983, Ser. No. 484,641
Claims priority, application Sweden, Oct. 18, 1982, 82-2486
Term of patent 14 years
U.S. Cl. D6—521

284,153
GOBLET
Alfred Blake, Hillsdale, N.J., and Michael Lax, New York, N.Y., assignors to American Commercial, Incorporated, Secaucus, N.J.
Filed Jun. 6, 1983, Ser. No. 501,256
The portion of the term of this patent subsequent to May 6, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

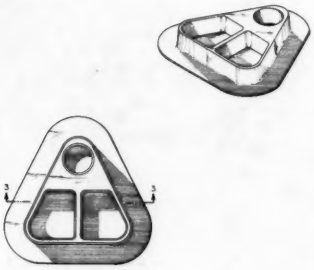
284,154
GOBLET
Alfred Blake, Hillsdale, N.J., and Michael Lax, New York, N.Y., assignors to American Commercial, Incorporated, Secaucus, N.J.
Filed Jun. 6, 1983, Ser. No. 501,292
The portion of the term of this patent subsequent to May 6, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

284,155
WINE GLASS
Alfred Blake, Hillsdale, N.J., and Michael Lax, New York, N.Y., assignors to American Commercial, Incorporated, Secaucus, N.J.
Filed Jun. 6, 1983, Ser. No. 501,174
The portion of the term of this patent subsequent to May 6, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

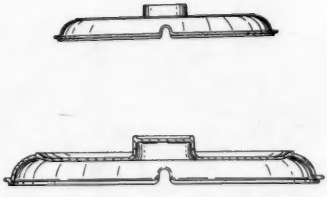
284,156
FOOD DISH
Malcolm J. Dodd, and Joseph A. Juhas, both of Litchfield, Conn., assignors to PTC Aerospace Inc., Bantam, Conn.
Filed Mar. 17, 1983, Ser. No. 476,177
Term of patent 14 years
U.S. Cl. D7—22



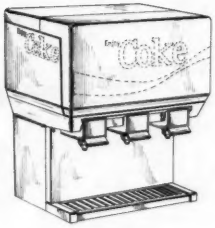
284,157
FOOD TRAY
John W. Morr, Kokomo, Ind., assignor to Conwell, Dawson, Morr Unlimited, Inc., Kokomo, Ind.
Filed Feb. 17, 1984, Ser. No. 581,503
Term of patent 14 years
U.S. Cl. D7—38



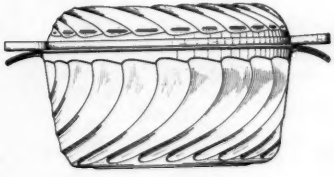
284,158
COVER FOR AN OVENWARE DISH
William C. Gerber, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 29, 1983, Ser. No. 527,094
Term of patent 14 years
U.S. Cl. D7—40



284,159
BEVERAGE DISPENSER
Samuel C. Crosby, Stone Mountain; William J. Saunders, Atlanta, both of Ga., and Richard T. Kennedy, Palos Heights, Ill., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Nov. 16, 1983, Ser. No. 552,387
Term of patent 14 years
U.S. Cl. D7—311

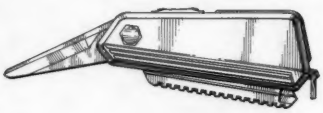


284,160
CASSEROLE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaButte 62510, Arques, France
Filed Nov. 21, 1983, Ser. No. 553,780
Term of patent 14 years
U.S. Cl. D7—360

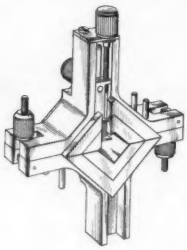


284,161
FLIP TOP CAN OPENER
Arthur D. DeLano, 106 Avenue A, Battle Creek, Mich. 49015
Filed Oct. 27, 1893, Ser. No. 546,000
Term of patent 14 years
U.S. Cl. D8—33

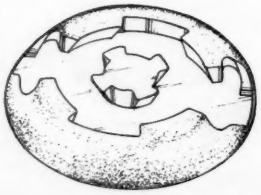
284,162
GRIP SCISSORS
Shigetsugu Takigawa, and Masuhiko Takigawa, both of Osaka, Japan, assignors to Ars Hamono Seizo Kabushikikaisha, Japan
Filed Jan. 6, 1984, Ser. No. 568,757
Claims priority, application Japan, Jul. 7, 1983, 58-29861
Term of patent 14 years
U.S. Cl. D8—57



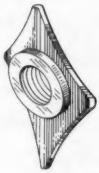
284,163
CABLE TOOL
Zdzislaw Bieganski, Harpenden, Great Britain, assignor to ABECO Limited, Woburn, England
Filed Jun. 14, 1983, Ser. No. 504,140
Claims priority, application United Kingdom, Dec. 15, 1982, 821010330
Term of patent 14 years
U.S. Cl. D8—99



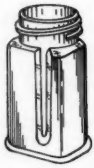
284,164
BASE MEMBER OF A DECK SOCKET OF A CARGO ANCHOR
Tsiung-Siung Tseng, No. 707, 3-4-28, Sakurazaka, Chuo-Ku, Fukuoka City 810, Japan
Filed Aug. 3, 1983, Ser. No. 520,044
Term of patent 14 years
U.S. Cl. D8—382



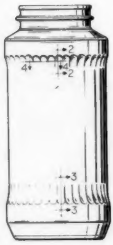
284,165
RETAINING NUT
Frank P. Brilando, Niles, and Thomas Fitzgerald, Bellwood, both of Ill., assignors to Schwinn Bicycle Company, Chicago, Ill.
Filed Nov. 18, 1983, Ser. No. 553,032
Term of patent 14 years
U.S. Cl. D8—397



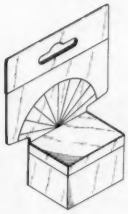
284,166
BOTTLE OR THE LIKE
John F. Buchholz, Boston; Robert S. Potts, Sherborn, and Henry J. Rahn, Sharon, all of Mass., assignors to Corning Glass Works, Corning, N.Y.
Filed Sep. 9, 1983, Ser. No. 531,161
Term of patent 14 years
U.S. Cl. D9—367



284,167
JAR
Michael K. Goettner, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Jan. 9, 1984, Ser. No. 569,357
Term of patent 14 years
U.S. Cl. D9—398



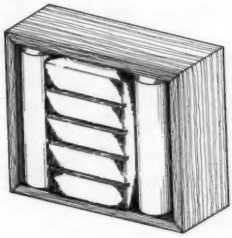
284,168
BOX FOR FILM PACKAGING
Edwin Ewry, Mill Valley, Calif., assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Dec. 4, 1984, Ser. No. 677,920
Term of patent 14 years
U.S. Cl. D9—415



284,169
WRIST WATCH
Carlo Adler, Cologny, Switzerland, assignor to Bijouterie Adler S.A., Geneva, Switzerland
Filed Nov. 21, 1983, Ser. No. 553,698
Claims priority, application Hague, Jun. 2, 1983, 73.245
Term of patent 14 years
U.S. Cl. D10—32

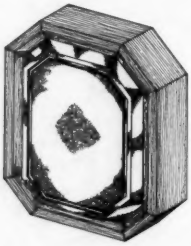
284,170
WRISTWATCH
Mieko Kurimura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Jan. 10, 1984, Ser. No. 569,702
Claims priority, application Japan, Jul. 15, 1983, 58-30887
Term of patent 14 years
U.S. Cl. D10—32

284,171
DOOR CHIME HOUSING
Monte L. Levin, New York, N.Y., assignor to Square D Company, Palatine, Ill.
Filed Jun. 1, 1984, Ser. No. 616,031
Term of patent 14 years
U.S. Cl. D10—118

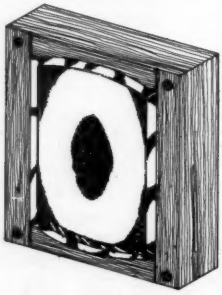


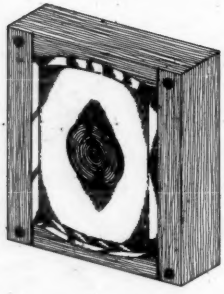
284,172
DOOR CHIME HOUSING
Monte L. Levin, New York, N.Y., assignor to Square D Company, Palatine, Ill.
Filed Jun. 1, 1984, Ser. No. 616,030
Term of patent 14 years
U.S. Cl. D10—118

284,173
CHIME COVER PLATE
Monte L. Levin, New York, N.Y., assignor to Square D Company, Palatine, Ill.
Filed Jul. 26, 1984, Ser. No. 634,894
Term of patent 14 years
U.S. Cl. D10—118

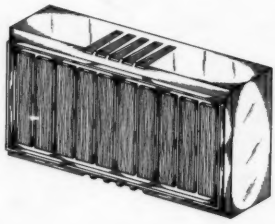


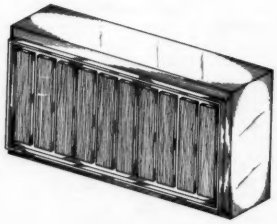
284,174
HOUSING FOR DOOR CHIMES OR THE LIKE
Monte L. Levin, New York, N.Y., assignor to Square D Company, Palatine, Ill.
Filed Jun. 1, 1984, Ser. No. 616,334
Term of patent 14 years
U.S. Cl. D10—118



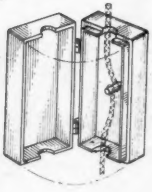


284,175
CHIME HOUSING
Monte L. Levin, New York, N.Y., assignor to Square D Company, Palatine, Ill.
Filed May 1, 1984, Ser. No. 616,029
Term of patent 14 years
U.S. Cl. D10—118





284,176
CHAIN GUARD FOR JEWELRY OR THE LIKE
Norma Battersby, 7386 Eagle Mills Rd., Willoughby, Ohio 44094
Filed Feb. 22, 1983, Ser. No. 468,171
Term of patent 14 years
U.S. Cl. D11—87



284,177

CLASP PORTION OF A WRIST WATCH WRISTLET

Joerg Hysek, Nyon, Switzerland, assignor to Jean Lassale, S.A., Geneva, Switzerland

Filed Aug. 1, 1983, Ser. No. 518,833

Claims priority, application Hague, Jan. 31, 1983, DM/002194

Term of patent 14 years

U.S. Cl. D11—87

284,178

AUTOMOBILE TIRE

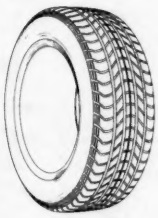
Misao Kawabata; Masataka Yamaoka, both of Saitama, and Masashiro Moriya, Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,446

Claims priority, application Japan, Jul. 1, 1983, 58-28190

Term of patent 14 years

U.S. Cl. D12—147



284,179

TIRE FOR A VEHICLE WHEEL

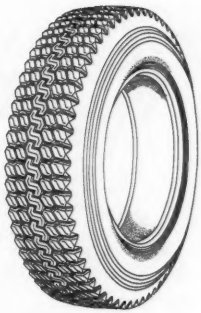
Ian Kemp, Tamworth, England, assignor to Dunlop Limited, London, England

Filed Feb. 28, 1984, Ser. No. 584,349

Claims priority, application United Kingdom, Sep. 24, 1983, 831015322

Term of patent 14 years

U.S. Cl. D12—147



284,180

COMBINED MOTORCYCLE FAIRING AND REAR VIEW MIRROR DIRECTION INDICATOR UNITS

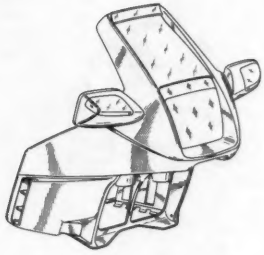
Karl H. Abe, Steinebach/Wörthsee, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Patentabteilung, Fed. Rep. of Germany

Filed Oct. 21, 1983, Ser. No. 544,374

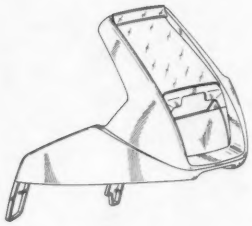
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, MR 13423

Term of patent 14 years

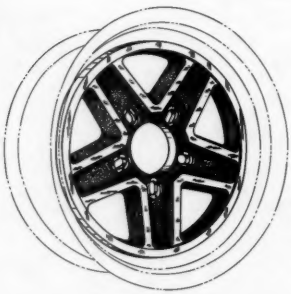
U.S. Cl. D12—182



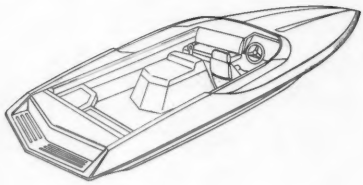
284,181
UPPER FAIRING FOR MOTORCYCLES
Karl H. Abe, Steinebach/Wörthsee, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Oct. 21, 1983, Ser. No. 544,290
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, MR 13423
Term of patent 14 years
U.S. Cl. D12—182



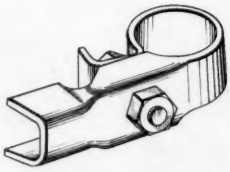
284,182
VEHICLE WHEEL CENTER
Raymond J. Hedlund, Concord, Calif., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Oct. 28, 1981, Ser. No. 315,806
Term of patent 14 years
U.S. Cl. D12—211



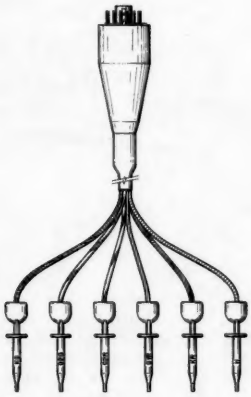
284,183
BOAT
Allan B. Hegg; Lloyd S. Makowski, both of Manistee, and James S. Phares, Farmington Hills, all of Mich., assignors to Century Boat Company, Manistee, Mich.
Filed Sep. 28, 1983, Ser. No. 536,858
Term of patent 14 years
U.S. Cl. D12—314



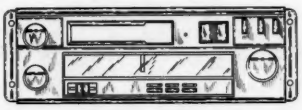
284,184
PRESSED METAL BATTERY TERMINAL CONNECTOR
Bruce R. G. Carey; Antony H. Julian; Desmond R. Dwight, all of Christchurch, and Graeme D. Carter, Wellington, all of New Zealand, assignors to Hamal Industries Limited, Christchurch, New Zealand
Filed Oct. 26, 1982, Ser. No. 436,712
Term of patent 14 years
U.S. Cl. D13—10



284,185
CRT ADAPTER
Robert T. Anderson, 3406 S. 28th St., Muskogee, Okla. 74401
Filed Apr. 18, 1983, Ser. No. 486,111
Term of patent 14 years
U.S. Cl. D13—24

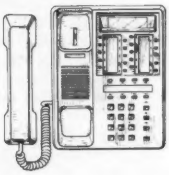


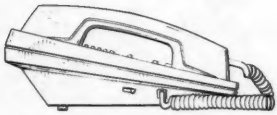
284,186
CAR RADIO RECEIVER
Daniel Hautbout, Val Des 4 Pigno Beynes, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 3, 1984, Ser. No. 576,610
Claims priority, application United Kingdom, Aug. 3, 1983, 1014465
Term of patent 14 years
U.S. Cl. D14—5



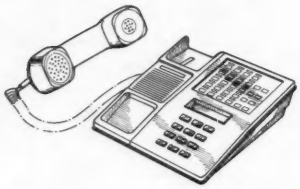
284,187
TELECOMMUNICATIONS EQUIPMENT CABINET
Michael Brown, and Robert B. Isaacs, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Mar. 5, 1984, Ser. No. 586,447
Term of patent 14 years
U.S. Cl. D14—52

284,188
TELEPHONE INSTRUMENT
Hideaki Kondo; Shinsuke Kadota; Keizou Ohta; Takeshi Nakatani, and Nagakazu Yokoyama, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Aug. 26, 1983, Ser. No. 526,840
Claims priority, application Japan, Feb. 28, 1983, 58-8035
Term of patent 14 years
U.S. Cl. D14—58



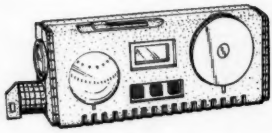


284,189
TELEPHONE
Akitaka Takeuchi, Kodaira; Motoaki Sakamoto, Tanashi; Yoku Yamagami, and Shoichi Onuma, both of Maebashi, all of Japan, assignors to Nakayo Telecommunications Inc., Tokyo, Japan
Filed Dec. 1, 1983, Ser. No. 556,945
Claims priority, application Japan, Jun. 28, 1983, 58-27641
Term of patent 14 years
U.S. Cl. D14—58

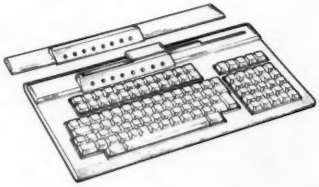


284,190
TELEPHONE
Teturo Ando, and Koichi Hara, both of Tokyo, Japan, assignors to Kabushikikaisha Taikodenki Seisakusho, Tokyo, Japan
Filed Sep. 27, 1983, Ser. No. 536,340
Claims priority, application Japan, Mar. 31, 1983, 58-13573
Term of patent 14 years
U.S. Cl. D14—58

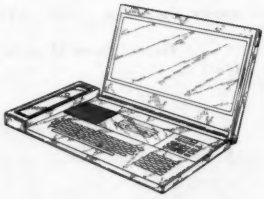
284,191
RADIO
Wong Kong-Yiu, 13, Chung-Shan Rd., Jen-Te Hsieng, Tainan Hsien, Taiwan
Filed Apr. 4, 1984, Ser. No. 596,608
Term of patent 14 years
U.S. Cl. D14—70



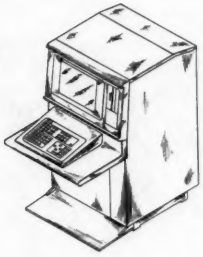
284,192
KEYBOARD
Per O. R. Lindhé, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Mar. 2, 1983, Ser. No. 471,462
Claims priority, application Sweden, Sep. 14, 1982, 82-2206
Term of patent 14 years
U.S. Cl. D14—100



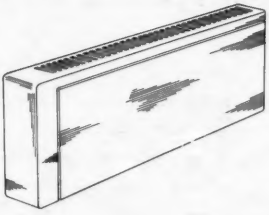
284,193
COMBINED TELEPHONE, RECORDER AND PORTABLE COMPUTER
Eric J. Marshall, 5 Carlton Gardens, London SW1, England
Filed Aug. 4, 1983, Ser. No. 520,285
Claims priority, application United Kingdom, Feb. 18, 1983, 1011512
Term of patent 14 years
U.S. Cl. D14—101



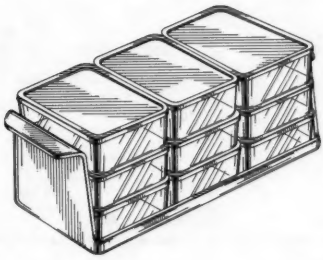
284,194
WORK STATION FOR PROCESS CONTROL OPERATIONS
Raymond Golden, Willowick, and George S. Whaley, Eastlake, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Sep. 19, 1983, Ser. No. 533,084
Term of patent 14 years
U.S. Cl. D14—103



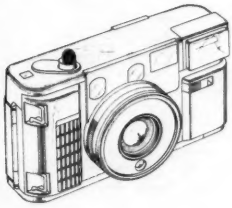
284,195
FEATURE MODULE FOR A PERSONAL COMPUTER
Myron F. Davis; Willis Y. Jordan, III; Robert L. Syler, all of Boca Raton, and Harold D. Yeaw, North Palm Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 7, 1983, Ser. No. 529,902
Term of patent 14 years
U.S. Cl. D14—114



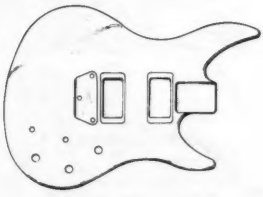
284,196
COMBINED REFRIGERATOR RACK AND FOOD STORAGE CONTAINERS THEREFOR
Robert Y. Wolff, 525 Constellation Rd., Wickenburg, Ariz. 85358
Filed Apr. 22, 1983, Ser. No. 487,876
Term of patent 14 years
U.S. Cl. D15—89



284,197
35 MM CAMERA
Kazuo Yamamoto; Kazuhiko Watarai, both of Hachioji, and Michio Imada, Kodaira, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jan. 9, 1984, Ser. No. 569,342
Claims priority, application Japan, Jul. 15, 1983, 58-30989
Term of patent 14 years
U.S. Cl. D16—6

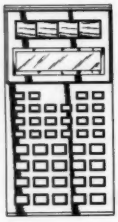


284,198
GUITAR BODY OR SIMILAR ARTICLE
Hartley D. Peavey, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.
Filed Oct. 7, 1983, Ser. No. 539,986
Term of patent 14 years
U.S. Cl. D17—20

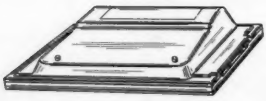


284,199
COMBINED RULER, CLOCK AND CALCULATOR
Robert S. K. Li, 2/F., Lee Kee Commercial Bldg., 233 Queen's Rd. Central, Hong Kong, Hong Kong
Filed Aug. 2, 1983, Ser. No. 519,557
Claims priority, application United Kingdom, May 20, 1983, 1013164
Term of patent 14 years
U.S. Cl. D18—2

284,200
CALCULATOR
Shigeaki Hayashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 1, 1984, Ser. No. 585,349
Claims priority, application Japan, Sep. 14, 1983, 58-40331
Term of patent 14 years
U.S. Cl. D18—7

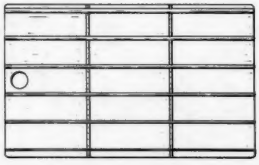


284,201
ELECTRONIC CALCULATOR
Atsuhiko Tokunaga, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 19, 1984, Ser. No. 622,095
Claims priority, application Japan, Dec. 20, 1983, 58-55298
Term of patent 14 years
U.S. Cl. D18—7

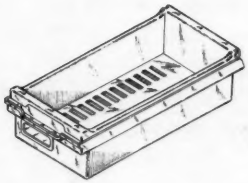


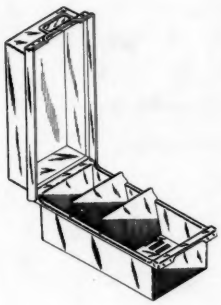
284,202
PRINTING CALCULATOR
Noriko Satake, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 19, 1984, Ser. No. 601,992
Claims priority, application Japan, Oct. 20, 1983, 58-45833
Term of patent 14 years
U.S. Cl. D18—7

284,203
GUITAR PRACTICE CARD
Duhain Landau, 51 Balaton Ave., Lk. Ronkonkoma, N.Y. 11779
Filed Aug. 30, 1983, Ser. No. 527,764
Term of patent 14 years
U.S. Cl. D19—62

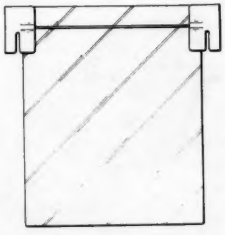


284,204
INDEX CARD STORAGE CONTAINER
Balthasar Kirchner, Eferding, Austria, assignor to Ernst Stadelmann Gesellschaft mbH, Eferding, Austria
Filed Feb. 28, 1984, Ser. No. 584,472
Term of patent 14 years
U.S. Cl. D19—76

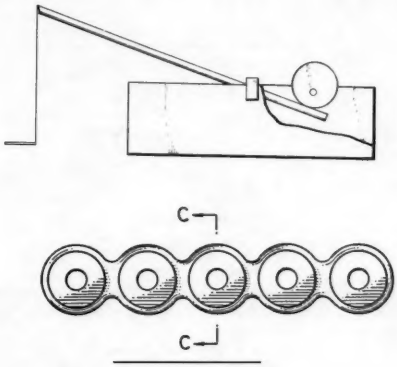




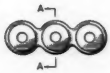
284,205
SUSPENDABLE BAG
Ronald B. Smernoff, Belmont, Calif., assignor to Analytical Products, Inc., Belmont, Calif.
Filed Aug. 1, 1983, Ser. No. 519,374
Term of patent 14 years
U.S. Cl. D19—90



284,206
NOVELTY FISHING MACHINE
Keith G. Vanderhye, and Robert A. Vanderhye, both of 801 Ridge Dr., McLean, Va. 22101-1625
Filed Sep. 28, 1983, Ser. No. 536,448
Term of patent 14 years
U.S. Cl. D21—59

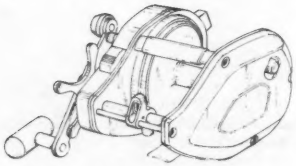


284,207
CONSTRUCTION TOY
Kenzou Kassai, Higashishimizu, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan
Filed Jun. 28, 1983, Ser. No. 508,514
Claims priority, application Japan, Dec. 29, 1982, 57-581561
Term of patent 14 years
U.S. Cl. D21—108

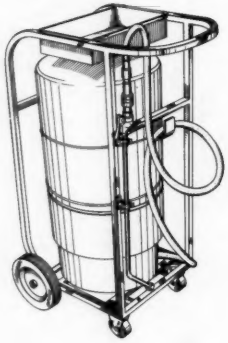


284,208
TOY GUN
Francis M. L. Barthropp, 4371 Marine Dr., West Vancouver, British Columbia, Canada V7V 1P3
Filed Aug. 15, 1984, Ser. No. 641,069
Term of patent 14 years
U.S. Cl. D21—147

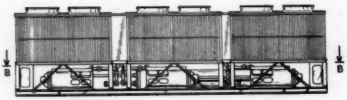
284,209
FISHING REEL
Shinichi Iwama, Higashi-kurume, and Hideo Nakamura, Musashino, both of Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jan. 6, 1983, Ser. No. 456,123
Claims priority, application Japan, Aug. 24, 1982, 57-38296
Term of patent 14 years
U.S. Cl. D22—25



284,210
PORTABLE SPRAYER FOR DISINFECTANT
Janet B. Rattray, Providence, and Owen R. Read, Glocester, both of R.I., assignors to Surgi-Clean Incorporated, East Providence, R.I.
Filed Jun. 29, 1983, Ser. No. 509,162
Term of patent 14 years
U.S. Cl. D23—18

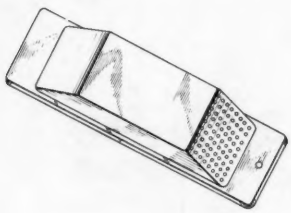


284,211
COOLING TOWER
Akira Miyamoto, and Kazuyuki Yamaguchi, both of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 2, 1983, Ser. No. 528,759
Claims priority, application Japan, Mar. 15, 1983, 58-11151
Term of patent 14 years
U.S. Cl. D23—139

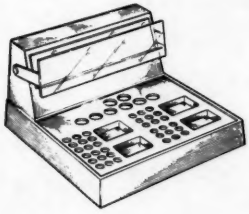


284,212
AIR FRESHENER
Wendelin P. Arnold, 315-8th Street South, Lethbridge, Alberta, Canada
Filed Aug. 22, 1983, Ser. No. 525,476
Claims priority, application Canada, Mar. 11, 1983, 11-03-83-4
Term of patent 14 years
U.S. Cl. D23—150

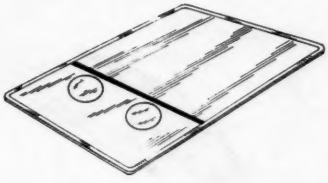
284,213
VENTILATOR FOR A FREIGHT CONTAINER
Paul E. Morgan, Bridgewater, N.J., assignor to CTI International, Inc., White Plains, N.Y.
Filed Apr. 7, 1983, Ser. No. 483,152
Term of patent 14 years
U.S. Cl. D23—151



284,214
BLOOD GROUPING APPARATUS
David E. Hatcher; William A. Broach, and Claude S. Baker, all of Houston, Tex., assignors to Gamma Biologicals, Inc., Houston, Tex.
Filed Oct. 31, 1983, Ser. No. 546,855
Term of patent 14 years
U.S. Cl. D24—8

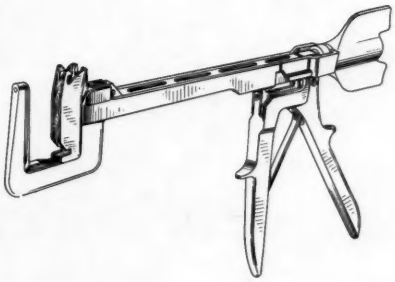


284,215
SPECIMEN-COLLECTION PAD FOR OCCULT-BLOOD DETECTION
Cynthia R. Sherwin, Montville, N.J., and Norman H. Oksman, Mt. Vernon, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed May 3, 1983, Ser. No. 491,006
Term of patent 14 years
U.S. Cl. D24—17



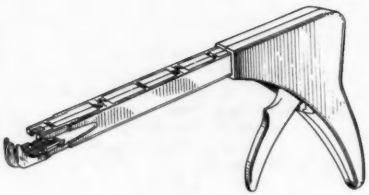
284,216
COMBINED CAST SPREADER AND MANIPULATOR
John B. Dyson-Hughes, Hollywood, Fla., assignor to Irving E. Fixel, Hollywood, Fla.
Filed Jul. 11, 1983, Ser. No. 512,760
Term of patent 14 years
U.S. Cl. D24—23

284,217
SURGICAL FASTENER APPLIER
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Jan. 20, 1984, Ser. No. 572,655
Term of patent 14 years
U.S. Cl. D24—26

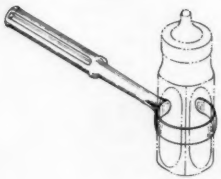


284,218
CARTRIDGE FOR A LATERAL ANASTOMOSIS SURGICAL STAPLER
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Apr. 10, 1984, Ser. No. 598,885
Term of patent 14 years
U.S. Cl. D24—27

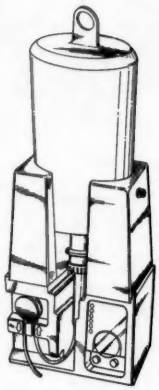
284,219
COMBINED SURGICAL OCCLUDING AND CUTTING INSTRUMENT
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Mar. 30, 1983, Ser. No. 480,447
Term of patent 14 years
U.S. Cl. D24—28



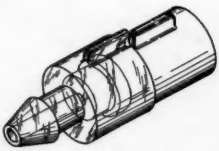
284,220
HAND HOLDER FOR BABY BOTTLE
Jeannette Pote, 402 Lindsley Dr., Apt. 1-C, Morristown, N.J. 07960
Filed Dec. 13, 1982, Ser. No. 448,931
Term of patent 14 years
U.S. Cl. D24—48



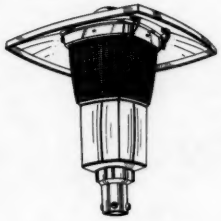
284,221
ENTERAL FEEDING PUMP
Gerald Kerkut, Southampton, England, assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jan. 10, 1983, Ser. No. 456,662
Term of patent 14 years
U.S. Cl. D24—51



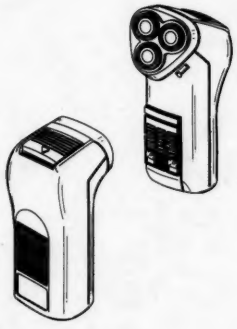
284,222
DRIP-FEED VALVE
Malcolm F. Hamilton, 10 Hissenben Gardens, Morden, Surrey, England
Filed Oct. 7, 1982, Ser. No. 433,306
Term of patent 14 years
U.S. Cl. D24—53



284,223
LUMINAIRE
John W. Harvey, Newark, Ohio, assignor to Manville Service Corporation, Denver, Colo.
Filed Sep. 16, 1983, Ser. No. 533,170
Term of patent 14 years
U.S. Cl. D26—67

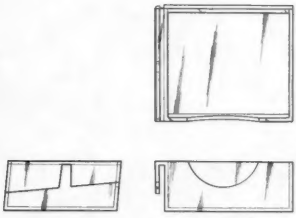


284,224
ELECTRIC SHAVER
Shunji Izumi, Matsumoto, Japan, assignor to Izumi Seimitsu Kogyo Kabushiki Kaisha, Matsumoto, Japan
Filed Jun. 14, 1984, Ser. No. 620,573
Claims priority, application Japan, Mar. 29, 1984, 59-12402
—Term of patent 14 years
U.S. Cl. D28—50

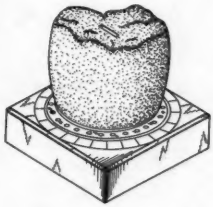


284,225
SHEATHED NAIL FILE
Thomas L. Dulick, Rye, N.Y., assignor to Barristo, Ltd., Chicago, Ill.
Filed Jul. 27, 1984, Ser. No. 635,227
Term of patent 14 years
U.S. Cl. D28—59

284,226
COSMETIC TRAY OR SIMILAR ARTICLE
Howard Sussman, 3101 NW. 25th St., Pompano Beach, Fla. 33060
Filed Sep. 26, 1983, Ser. No. 535,586
Term of patent 14 years
U.S. Cl. D28—73



284,227
COMBINED TOOTH SAVER AND COIN BANK
Steven Dagowitz, and Gail L. Dagowitz, both of 15 Cohawney Rd., Scarsdale, N.Y. 10583
Filed Oct. 17, 1983, Ser. No. 542,277
Term of patent 14 years
U.S. Cl. D99—37



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JUNE, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Niskanen, Toivo, 4,594,052, Cl. 415-121.00B.

A. H. Robins Company, Inc.: *See*—
Lo, Young S.; and Mays, Richard P., 4,594,189, Cl. 260-239.00A.

Aarts, Mathias L. C., to Product Suppliers AG. Leak detection. 4,593,554, Cl. 73-49.300.

AB Asea-Atom: *See*—
Stendahl, Gunnar, 4,593,478, Cl. 34-57.00R.

Abdou-Sabet, Sabet; and Shen, Kuo-Shein, to Monsanto Company. Process for the preparation of thermoplastic elastomers. 4,594,390, Cl. 525-232.000.

Abe, Osamu: *See*—
Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Osamu; and Hasegawa, Taiji, 4,593,663, Cl. 123-440.000.

Abe, Zenwemon: *See*—
Yamada, Yoshifumi; Tanaka, Kunio; and Abe, Zenwemon, 4,594,550, Cl. 324-307.000.

Abel, Jack. Racquet stringing system with string tension indicating means. 4,593,905, Cl. 273-73.00D.

Abele, Wolfgang, deceased: *See*—
Koppe, Herbert; Abele, Wolfgang, deceased; Esser, Franz; Gaida, Wolfram; and Hoefke, Wolfgang, 4,594,344, Cl. 514-222.000.

Abu Aktiebolag: *See*—
Moosberg, Borje; S.; and Karlsson, Jarding U., 4,593,866, Cl. 242-84.52B.

Abu-Shumays, Ibrahim K.; and Abu-Shumays, Mary D. Polyhedral and sperical cubic puzzles. 4,593,907, Cl. 273-153.00S.

Abu-Shumays, Mary D.: *See*—
Abu-Shumays, Ibrahim K.; and Abu-Shumays, Mary D., 4,593,907, Cl. 273-153.00S.

Achia, Biddanda U.; DeKraker, Abraham R.; and Rossi, Albert, to Exxon Research and Engineering Co. Dewaxing waxy hydrocarbon oils using di-alkyl fumarate-vinyl laurate copolymer dewaxing aids. 4,594,142, Cl. 208-33.000.

Ackley, Donald E., to RCA Corporation. Phase-locked laser array having a non-uniform spacing between lasing regions. 4,594,719, Cl. 372-50.000.

Adachi, Hideki; Tomosada, Masahiro; Hirose, Masayuki; Miyata, Masanori; and Komiya, Yutaka, to Canon Kabushiki Kaisha. Copying apparatus. 4,593,999, Cl. 355-55.000.

Adamowicz, Slawomir: *See*—
Stich, Bodo; Hassler, Ernst; Adamowicz, Slawomir; and Cyphelly, Ivan J., 4,593,715, Cl. 137-503.000.

Adams, Charles C.; and Dickas, Charles H., III. Universal frame for boat mounted game blind. 4,593,641, Cl. 114-343.000.

Adkins, David G., to Mead Corporation, The. Amine-formaldehyde microencapsulation process. 4,594,370, Cl. 523-208.000.

Adler, Michael S., to General Electric Company. Fabrication of integrated circuit with complementary, dielectrically-isolated, high voltage semiconductor devices. 4,593,458, Cl. 29-576.00W.

Advanced Micro Devices, Inc.: *See*—
Maniar, Mohammad Y.; and Dines, Steven, 4,594,654, Cl. 364-200.000.

Advanced NMR Systems, Inc.: *See*—
Maudsley, Andrew A., 4,594,566, Cl. 333-219.000.

Affarsverket FFV: *See*—
Pettersson, Rolf; and Tiseli, Claes, 4,593,620, Cl. 102-372.000.

Affolter, Walter, to Mondaine Watch Ltd. Watertight case for watches. 4,594,008, Cl. 368-276.000.

Agfa-Gevaert AG: *See*—
Auer, Josef; and Hackenberg, Hubert, 4,593,990, Cl. 355-45.000.

Agrimatic Corporation: *See*—
Miller, Gary E.; and Sheeks, Perry, 4,593,646, Cl. 119-1.000.

Ahlers, Klaas: *See*—
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,594,136, Cl. 204-181.700.

Aibe, Toshio: *See*—
Nishino, Hiroshi; and Aibe, Toshio, 4,594,231, Cl. 423-210.000.

Aida, Shunichi: *See*—
Sasaki, Noboru; Aida, Shunichi; and Ikeda, Tadashi, 4,594,317, Cl. 430-574.000.

Air Preheater Company, Inc., The: *See*—
Finnemore, Harlan E., 4,593,750, Cl. 165-9.000.

Air Products and Chemicals, Inc.: *See*—
Longsworth, Ralph C., 4,593,530, Cl. 62-55.500.

Aisin Seiki Kabushiki Kaisha: *See*—
Omitsu, Takashi, 4,593,581, Cl. 74-866.000.

Akazome, Giichi: *See*—
Kobayashi, Toshiaki; Terasawa, Shizuo; Akazome, Giichi; and Murai, Koichi, 4,594,167, Cl. 252-3.000.

Akiba, Tokuji: *See*—
Minegishi, Keiichi; Akiba, Tokuji; Katayama, Keiichi; and Machida, Hiroshi, 4,594,209, Cl. 264-66.000.

Akiyama, Hideaki; Iguchi, Susumu; and Horigome, Hirofumi, to Ricoh Company, Ltd. Focus condition indicating device of an auto-focus system. 4,593,988, Cl. 354-409.000.

Akiyama, Yoshinori: *See*—
Nara, Akio; Yazawa, Akio; and Akiyama, Yoshinori, 4,593,670, Cl. 123-545.000.

Akzo NV: *See*—
Josefiak, Christoph; and Wechs, Friedbert, 4,594,207, Cl. 264-41.000.

Alameda, Robert; and Ash, Raymond, to Alameda, Robert; and Cooper, Richard P. Apparatus for forming tight packages. 4,593,516, Cl. 53-75.000.

Albertsson, Stig L. Snow-making machine. 4,593,854, Cl. 239-14.000.

Albrecht, Ernest E.; and Cooper, Paul. Page-turning apparatus. 4,593,597, Cl. 84-487.000.

Albrecht, Konrad; and Frisch, Gerhard, to Hoechst Aktiengesellschaft. Plant protection agents in the form of mixed dispersions. 4,594,096, Cl. 71-93.000.

Alexander, William J., III. Cloth inspection stand for loom takeup. 4,593,725, Cl. 139-304.000.

Alexander, William W.: *See*—
Geissel Francis A.; Alexander, William W.; and Rys-Sikora, John, 4,594,367, Cl. 523-167.000.

Allen, Mark L. High security cylinder operated deadbolt lock. 4,593,546, Cl. 70-380.000.

Allen, William P.: *See*—
Brewer, James S.; and Allen, William P., 4,593,790, Cl. 182-214.000.

Allied Corporation: *See*—
Fujawa, Charles S.; and Masteller, Sara B., 4,594,668, Cl. 364-431.020.
Guillet, James E., 4,594,309, Cl. 430-270.000.
Hawes, David J., 4,593,523, Cl. 60-39.281.
Nyilas, Emery; and Chiu, Tin-Ho, 4,594,407, Cl. 528-272.000.
Reimschuessel, Herbert K.; and Kocur, Michael A., 4,594,452, Cl. 564-292.000.
Reybould, Derek, 4,594,104, Cl. 75-243.000.
Williams, Robert L.; and Marks, Christopher, 4,593,464, Cl. 29-879.000.

Allied Tube & Conduit Corporation: *See*—
Byrd, Lucid L., 4,593,550, Cl. 72-199.000.

Allis-Chalmers Corporation: *See*—
Matthews, Dean A., 4,593,791, Cl. 187-9.00E.

Allsop, Inc.: *See*—
d'Alayer de Costemore d'Arc, Stephane M., 4,594,629, Cl. 360-128.000.

Alps Electric Co., Ltd.: *See*—
Hosogoe, Junichi, 4,594,586, Cl. 340-710.000.

Alsenz, Richard H. Method and apparatus for detecting and controlling the formation of ice or frost. 4,593,533, Cl. 62-140.000.

Alsthom-Atlantique, S.A.: *See*—
Dubots, Patrick; and Renard, Jean-Claude, 4,594,218, Cl. 419-4.000.

Altech Industries, Inc.: *See*—
Hills, Robert A., 4,594,017, Cl. 403-6.000.

Altherr, Russell G., to AMSTED Industries Incorporated. Railway car drawbar connection with guided slack adjusting wedges. 4,593,827, Cl. 213-50.000.

Altherr, Russell G., to AMSTED Industries Incorporated. Articulated railway car connection with guided slack adjusting wedges. 4,593,829, Cl. 213-75.00R.

Aluminum Company of America: *See*—
Hochbein, David E., 4,593,848, Cl. 228-2.000.
Otto, William L., Jr.; Lawson, Neal L.; and Kuhn, Howard A., 4,593,551, Cl. 72-240.000.
Rogers, Elmer H., Jr., 4,593,755, Cl. 165-145.000.
Yu, Ho; Jacoby, John E.; and Ramser, Robert A., 4,593,745, Cl. 164-487.000.

Alusuisse Italia S.p.A.: *See*—
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, 4,594,433, Cl. 549-256.000.

Amano, Haruo: *See*—
Goto, Hideto; and Amano, Haruo, 4,594,606, Cl. 357-68.000.

Amano, Masatoshi: *See*—
Honma, Ichiro; Hirai, Masaharu; Amano, Masatoshi; and Takumi, Nobusuke, 4,594,267, Cl. 427-127.000.

Ambler, Edward C.: *See*—
Arute, William J.; Spargo, Thomas W.; and Ambler, Edward C., 4,593,945, Cl. 292-201.000.

American Cyanamid Company: *See*—
Kohli, Dalip K., 4,594,373, Cl. 523-400.000.

Speltz, Laurine M.; Walworth, Bryant L.; and Pavlista, Alexander D., 4,594,092, Cl. 71-77.000.

American Electronic Laboratories, Inc.: *See—*
Shillady, Robert W., 4,594,557, Cl. 329-160.000.

American Filtrona Corporation: *See—*
Berger, Richard M., 4,594,162, Cl. 210-493.100.

American Home Products Corporation: *See—*
Musser, John H.; and Kubrak, Dennis M., 4,594,425, Cl. 548-161.000.

American Microsystems, Inc.: *See—*
Mao, Roger A., 4,594,577, Cl. 340-347.0DA.

American Sterilizer Company: *See—*
Dyke, Denis G.; and Oshlag, David A., 4,594,223, Cl. 422-56.000.
Yeaney, Gerald L.; and Klein, Roy S., 4,593,822, Cl. 211-41.000.

Ametek, Inc. - Plymouth Products Division: *See—*
Hatch, Gary L., 4,594,392, Cl. 525-327.100.

AMP Incorporated: *See—*
Cosmo, Nicola, 4,593,961, Cl. 339-61.00M.
Forney, Edgar W., Jr.; and Hogendobler, Richard S., 4,593,964, Cl. 339-177.00R.
Joly, Jean C., 4,593,965, Cl. 339-192.00R.
Kamono, Takashi; and Otsu, Akihiko, 4,593,463, Cl. 29-884.000.
Keahey, Sammie G.; Keizer, Alan S.; and Lobb, Thomas T., 4,593,452, Cl. 29-564.600.
Michael, George W., III, 4,594,029, Cl. 408-1.00R.
Millhimes, Wayne L.; and Murren, Daniel J., 4,593,960, Cl. 339-42.000.

Ampex Corporation: *See—*
Williams, Marshall, 4,594,563, Cl. 331-1.00A.

AMSTED Industries Incorporated: *See—*
Altherr, Russell G., 4,593,827, Cl. 213-50.000.
Altherr, Russell G., 4,593,829, Cl. 213-75.00R.

Analytic Power Corporation: *See—*
Bloomfield, David P., 4,593,534, Cl. 62-201.000.

Anayama, Ushio: *See—*
Kubono, Shunji; and Anayama, Ushio, 4,593,996, Cl. 355-5.000.

Andersen, Erik; Edwards, Robert B., II; and Quinn, David G., to Viridian, Inc. Non-occluding high flow enteral feeding tube. 4,594,074, Cl. 604-270.000.

Anderson, Burton C.; England, David C.; and Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Cyclic monomers derived from trifluoropyruvate esters, amended to polymers and polymer films from dioxoles. 4,594,399, Cl. 526-247.000.

Anderson, Norman L., to United States of America, Energy. Automated apparatus for producing gradient gels. 4,594,064, Cl. 425-145.000.

Andersson, Jonny; and Lund, Stellan. Oscillating separator for a fastener-driving device. 4,593,845, Cl. 227-117.000.

Andreae, Anton C.: *See—*
Kussendrager, Klaas D.; and Andreae, Anton C., 4,594,110, Cl. 127-31.000.

Andres, Uri T.; Devernoe, Alan L.; and Walker, Michael S., to Mag-Sep Corp. Apparatus and method employing magnetic fluids for separating particles. 4,594,149, Cl. 209-1.000.

Anglo American Clays Corporation: *See—*
Cook, Jerry A.; Garner, Robert H.; Turner, Ralph E., Jr.; and Bilimoria, Bomi M., 4,593,860, Cl. 241-23.000.

Anondson, Stanton L.: *See—*
Procter, Richard W.; and Anondson, Stanton L., 4,594,249, Cl. 424-125.000.

Anselmo, John; and Blatnik, William A. Golf club swing training device. 4,593,909, Cl. 273-188.00R.

Antonie, Charles H.; and Murray, Thomas K., III, to International Business Machines Corporation. Robotic, in-transit, device tester/-sorter. 4,593,820, Cl. 209-573.000.

Antos, George J.; and Wang, Li, to UOP Inc. Platinum-, rhenium-, indium-containing catalysts for conversion of hydrocarbons. 4,594,334, Cl. 502-223.000.

Anzai, Mitsutoshi; Yamaguchi, Masahiko; Gonda, Michihiro; Kanasugi, Mikiko; and Obara, Toshio, to Hodogaya Chemical Co., Ltd. Fluoran compounds. 4,594,601, Cl. 346-221.000.

Aoi, Kazuo; and Ozawa, Toshikazu, to Yamaha Hatsudoki Kabushiki Kaisha. Camshaft bearing arrangement. 4,593,657, Cl. 123-90.600.

Aoki, Kaoru: *See—*
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.

Aoki, Takao; and Ushioda, Keisaku, to Canon Kabushiki Kaisha. Color image forming apparatus. 4,593,991, Cl. 355-14.00D.

Aoshima, Shinji: *See—*
Tomisawa, Norio; and Aoshima, Shinji, 4,594,703, Cl. 369-59.000.

Aoyagi, Yoshiaki: *See—*
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Murase, Masao; Inoue, Kichiro; and Shirahase, Ichiro, 4,594,345, Cl. 514-234.000.

Apace Research Limited: *See—*
Reeves, Russell R., 4,594,466, Cl. 568-919.000.

Applications Mecaniques et Robinetterie Industrielle (A.M.R.I.): *See—*
Laulhe, Rene ; and Garrigues, Jean-Claude, 4,593,916, Cl. 277-12.000.

Applied Technologies Associates: *See—*
Brown, David C.; Engebretson, Harold J.; and Watson, Fred L., 4,593,559, Cl. 73-151.000.

Araga, Toshima: *See—*
Suzuki, Shoichi; Kurobe, Moriji; Araga, Toshima; and Hiruta, Osamu, 4,594,112, Cl. 148-6.14R.

Arai, Kazumi; Koyama, Mikio; and Okaniwa, Kenichiro, to Konishiroku Photo Industry Co., Ltd. Elements for analysis of calcium. 4,594,225, Cl. 422-56.000.

Arai, Shinichi: *See—*
Sugimoto, Koichi; Koizumi, Kiyohide; Hamada, Toyohide; and Arai, Shinichi, 4,594,671, Cl. 364-513.000.

Arai, Takao: *See—*
Noguchi, Takaharu; Yamazaki, Shigeru; and Arai, Takao, 4,594,621, Cl. 360-77.000.

Arai, Yoshihiro, to Unitika Limited. Method of manufacturing shaped articles with excellent heat resistance and adhesiveness to rubber from a composition comprising polyester and epoxidized polybutadiene and adhering said articles to rubber. 4,594,388, Cl. 525-177.000.

Araki, Shigeru; and Kato, Hideaki, to NEC Corporation. Bimorph electromechanical transducer and control circuit device therefor. 4,594,526, Cl. 310-317.000.

Arco Products Corp: *See—*
Warburg, Joseph H., 4,594,032, Cl. 408-115.00R.

Arifian, Kenneth C.; and Skonieczny, Joseph P., to United Technologies Corporation. Redundant control system for X-wing valve actuators. 4,594,537, Cl. 318-564.000.

Ariga, Yoshio; and Watanabe, Shinpei, to Honda Giken Kogyo Kabushiki Kaisha. Automatic welding apparatus. 4,593,850, Cl. 228-47.000.

Armah, Ben: *See—*
Cohnen, Erich; and Armah, Ben, 4,594,419, Cl. 544-311.000.

Armstrong, Charles J., to Boart International Limited. Rotary rock drilling chuck. 4,593,769, Cl. 173-145.000.

Armstrong Store Fixture Corporation: *See—*
Pfeifer, William, 4,593,824, Cl. 211-57.100.

Arora, Sanjiv, to Ricoh Company, Ltd.; and Ricoh Systems, Inc. Integrated laser diode scanner. 4,594,600, Cl. 346-160.000.

Artemia N.V.: *See—*
Sorgeloos, Patrick P.; Versichele, Danny H.; Leger, Philippe P. J. M.; and Lavens, Patrick A., 4,593,647, Cl. 119-2.000.

Arute, William J.; Spargo, Thomas W.; and Ambler, Edward C., to Stanley Works, The. Oven latch assembly. 4,593,945, Cl. 292-201.000.

Asahi Glass Co. Ltd.: *See—*
Kurata, Motoharu, 4,594,089, Cl. 65-135.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Minakuchi, Tadashi, 4,593,985, Cl. 354-238.100.

Asayama, Yoshiaki; Yamada, Tetsuyo; and Hirate, Shintaro, to Mitsubishi Denki Kabushiki Kaisha; and NGK Spark Plug Co., Ltd. Air/fuel ratio detector. 4,594,139, Cl. 204-410.000.

ASEA AB: *See—*
Folgero, Kare; and Kollberg, Sten, 4,594,723, Cl. 373-142.000.

Ash, Raymond: *See—*
Alameda, Robert; and Ash, Raymond, 4,593,516, Cl. 53-75.000.

Asher, Reginald K.: *See—*
Folk, Lee E.; and Asher, Reginald K., 4,594,263, Cl. 427-53.100.

Ashland Oil, Inc.: *See—*
Goel, Anil B.; Tufts, Timothy A.; and Blackburn, Peggy A., 4,594,397, Cl. 525-528.000.

Astrl Corporation: *See—*
Lopez, Wallace, 4,594,084, Cl. 62-5.000.

AT&T Bell Laboratories: *See—*
Chapin, John T.; and Sabia, Raffaele A., 4,594,380, Cl. 524-144.000.
McCullough, Harold E., 4,594,490, Cl. 200-248.000.

AT&T Information Systems Inc. Bell Telephone Laboratories, Inc.: *See—*
Farrow, Cecil W.; and Salz, Jack, 4,594,479, Cl. 179-170.200.

AT&T Technologies, Inc.: *See—*
Noirot, Tamarra J., 4,594,477, Cl. 179-18.0AD.
Paek, Un-Chul; and Schroeder, Charles M., 4,594,088, Cl. 65-3.400.

Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Osamu; and Hasegawa, Taiji, to Hitachi, Ltd. Control apparatus for an internal combustion engine having a carburetor. 4,593,663, Cl. 123-440.000.

Athans, Robert J. Electrocardiograph sensor positioning device and method. 4,593,698, Cl. 128-644.000.

Atlantic Richfield Company: *See—*
Kesling, Haven S., Jr.; and Gillman, Hyman D., 4,594,185, Cl. 252-551.000.

Atlas Copco Aktiebolag: *See—*
Eklof, Ake T., 4,593,768, Cl. 173-116.000.

Aucouturier, Jeanne; and Leboutet, Hubert, to CGR MeV. Accelerating self-focusing cavity for charged particles. 4,594,530, Cl. 315-5.410.

Audi AG: *See—*
Barske, Heiko, 4,593,558, Cl. 73-147.000.

Auer, Josef; and Hackenberg, Hubert, to Agfa-Gevaert AG. Control device for controlling a diaphragm slot in a microfilm-reading and enlarging apparatus. 4,593,990, Cl. 355-45.000.

Aune, Jan A.; and Evensen, Knut, to Elkem A/S. Method for charging liquid slag to a closed smelting furnace. 4,593,886, Cl. 266-44.000.

Autographic Business Forms, Inc.: *See—*
Shoup, Walter C., II, 4,593,469, Cl. 33-1.00M.

Automobiles Citroen: *See—*
Galtier, Lucien, 4,593,781, Cl. 180-79.100.
Galtier, Lucien, 4,593,781, Cl. 180-79.100.

Avery, James M.; and Hoyer, Elmer A., to NCR Corporation. Digital processor for speech signals. 4,594,575, Cl. 340-347.0AD.

Awada, Yoshihisa: *See*—
Kikkawa, Seiichi; Ogata, Hisanao; Hakuraku, Yoshinori; Mase, Masahiro; Tsumaki, Nobuo; Awada, Yoshihisa; and Kajiwara, Hiroki, 4,593,835, Cl. 222-131.000.

Baba, Masaharu, to Kabushiki Kaisha Toshiba. Socket for baseless lamp. 4,593,958, Cl. 339-17.00D.

Baba, Takeshi; Iwasa, Hiroki; and Ohmi, Kyozo, to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Apparatus for covering disc wheel for motor vehicle. 4,593,953, Cl. 301-6.0CS.

Babarin, Sergei. Buckle for belt. 4,593,439, Cl. 24-197.000.

Babcock & Wilcox Company, The: *See*—
Dziubakowski, Donald J.; and Smith, John W., 4,593,477, Cl. 34-10.000.

Baggiolini, Enrico G.; Uskokovic, Milan R.; and Wovkulich, Peter M., to Hoffman-La Roche Inc. Process for the synthesis of 1α,23(S),25-trihydroxycholecalciferol and 1α,23(R),25-trihydroxycholecalciferol. 4,594,432, Cl. 549-214.000.

Bailey, David A., to Garrett Corporation, The. Rapid transient response chemical energy power plant apparatus and method. 4,593,528, Cl. 60-673.000.

Bailey, Frank V.: *See*—
VanRens, Russell J.; and Bailey, Frank V., 4,593,739, Cl. 164-34.000.

Baker, Joseph S.; and Pflaumer, Phillip F., to Procter & Gamble Company, The. Temperable confectionery compositions having improved mouth melt suitable for chocolate. 4,594,259, Cl. 426-613.000.

Baldassari, Giuseppe, to Southwire Company. Automatic centering of molten metal pour spout metering pin. 4,594,119, Cl. 156-94.000.

Baldoli, Emiliana: *See*—
Toja, Emilio; Barone, Domenico; and Baldoli, Emiliana, 4,594,348, Cl. 514-253.000.

Ball Corporation: *See*—
Falk, Robert A.; and Phillis, Gary L., 4,594,000, Cl. 356-5.000.

Ballard, James W.: *See*—
Bonnici, Charles; and Ballard, James W., 4,593,504, Cl. 52-199.000.

Bankers Trust Company: *See*—
Bullock, Joseph J., 4,593,830, Cl. 215-256.000.

Baran, Patrick S.: *See*—
Zaruba, John V.; Baran, Patrick S.; Webb, Terry E.; and Disko, Harry, 4,594,071, Cl. 446-99.000.

Barauke, Norbert, to Hans and Fritz Stahlecker. Spinning machine drafting roller adjusting arrangement. 4,593,438, Cl. 19-261.000.

Barclay, Terry W.; Cielo, John R.; Martin, William J.; and Trushell, James B., to International Business Machines Corporation. Plasma display margin control. 4,594,588, Cl. 340-771.000.

Bardutzky, Bernd; Dinges, Reinhard; and Gumm, Peter, to Hoechst Aktiengeselischaft. Roll-fusing apparatus. 4,594,068, Cl. 432-60.000.

Baring, Rolf; Rudert, Wolfgang; and Wolters, Gerd-Michael, to MTU Friedrichshafen GmbH. Valve control of a supercharged four-cycle internal combustion engine. 4,593,662, Cl. 123-198.00F.

Barlow, John P., to International Business Machines Corporation. System for detecting and diagnosing noise caused by simultaneous current switching. 4,594,677, Cl. 364-578.000.

Barone, Domenico: *See*—
Toja, Emilio; Barone, Domenico; and Baldoli, Emiliana, 4,594,348, Cl. 514-253.000.

Barone, Tomas. Fuel economy apparatus. 4,593,672, Cl. 123-568.000.

Barr, John D., to NL Industries, Inc. Drag bit and cutters. 4,593,777, Cl. 175-379.000.

Barr & Stroud Limited: *See*—
Runciman, Herbert M., 4,594,508, Cl. 250-334.000.

Barreras, Francisco J., to Cordis Corporation. Clock oscillator for a cardiac pacer having frequency compensation for temperature and voltage fluctuations. 4,594,565, Cl. 331-108.00A.

Barrett, Donovan L.: *See*—
Hobgood, Hudson M.; Thomas, Richard N.; and Barrett, Donovan L., 4,594,173, Cl. 252-62.3GA.

Barske, Heiko, to Audi AG. Method of optimizing the aerodynamics of a vehicle body. 4,593,558, Cl. 73-147.000.

Barzaghi, Fernando: *See*—
Bianchi, Mario; and Barzaghi, Fernando, 4,594,443, Cl. 560-053.000.

BASF Aktiengesellschaft: *See*—
Henning, Georg, 4,594,411, Cl. 534-784.000.
Hoelderich, Wolfgang; Riekert, Lothar; Kotter, Michael; and Hammon, Ulrich, 4,594,332, Cl. 502-64.000.
Kempter, Fritz E.; Sabelus, Gunther; Schupp, Eberhard; and Weiss, Wolfram, 4,594,403, Cl. 528-113.000.
Merger, Franz; Hettinger, Peter; Hupfer, Leopold; and Paetsch, Juergen, 4,594,461, Cl. 568-853.000.
Schaefer-Luederssen, Ulrich; Jaedicke, Hagen; Paust, Joachim; and Eggersdorfer, Manfred, 4,594,456, Cl. 568-447.000.
Schnabel, Rolf; and Weitz, Hans-Martin, 4,594,462, Cl. 568-864.000.
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,594,136, Cl. 204-181.700.

Bata Limited: *See*—
Geissel Francis A.; Alexander, William W.; and Rys-Sikora, John, 4,594,367, Cl. 523-167.000.

Bata Schuh AG: *See*—
Mayer, Hubert, 4,593,482, Cl. 36-7.500.

Batchelor, Anthony M.: *See*—
Zemelman, Valery B.; Burgess, Gary L.; Vitti, Rudolf A.; Forman, Todd M.; Batchelor, Anthony M.; and Leblanc, Yvon N., 4,594,256, Cl. 426-594.000.

Battelle Memorial Institute: *See*—
Hackman, Donald J.; Caudy, Don W.; and Nikodem, Leslie F., 4,593,885, Cl. 254-277.000.

Bauakademie der Deutschen Demokratischen Republik: *See*—
Zschocke, Christian; and Forchheim, Hans, 4,593,884, Cl. 254-264.000.

Baudrant, Annie; and Marty, Michel, to Societe pour d'Etude et la Fabrication de Circuits Integres Speciaux EFCS. Process for manufacturing an integrated circuit with tantalum silicide connections utilizing self-aligned oxidation. 4,593,454, Cl. 29-571.000.

Bauer, Klaus; Bieringer, Hermann; Burstell, Helmut; and Kocur, Jean, to Hoechst Aktiengesellschaft. Phosphorus-containing functional derivatives of acetic acid, process for their preparation and herbicidal and growth-regulating agents containing them. 4,594,098, Cl. 71-86.000.

Baum, Kurt: *See*—
Grakauskas, Vytautas; Garver, Lee C.; and Baum, Kurt, 4,594,430, Cl. 549-9.000.

Baumert, Dietrich: *See*—
Skotsch, Carlo; Baumert, Dietrich; and Krahmer, Hansjorg, 4,594,095, Cl. 71-92.000.

Bayer Aktiengesellschaft: *See*—
Bonse, Gerhard; Marzolph, Gerhard; and Blank, Heinz U., 4,594,427, Cl. 548-226.000.
Findeisen, Kurt; Konig, Klaus; Fauss, Rudolf; and Heitkamper, Peter, 4,594,441, Cl. 560-25.000.
Grimm, Robert; and Sowade, Bernd, 4,594,105, Cl. 75-257.000.
Heidenreich, Klaus; Depcik, Hans-Werner; and Radojewski, Hans, 4,594,204, Cl. 264-25.000.
Henneke, Karl-Wilhelm; Diehl, Herbert; and Wedemeyer, Karl-fried, 4,594,467, Cl. 570-193.000.
Krishnan, Sivaram; Kircher, Klaus; and Kress, Hans-Jurgen, 4,594,375, Cl. 524-89.000.
Stahl, Hans-Georg; Schwindt, Jurgen; and Nachtkamp, Klaus, 4,594,374, Cl. 523-501.000.
Thoma, Wilhelm; Noll, Klaus; Nachtkamp, Klaus; Pedain, Josef; and Schroer, Walter, 4,594,385, Cl. 524-839.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. 4,594,100, Cl. 71-124.000.

BBC Brown, Boveri & Company, Ltd.: *See*—
Schminke, Wolfram, 4,594,634, Cl. 361-93.000.

Beauman, William H.; Jarog, Dean J.; and Micklin, Steven H., to Everpure, Inc. Stabilized polybromide resins and method of preparation. 4,594,361, Cl. 521-28.000.

Bebber, Hans J.; Rossner, Heinrich-Otto; and Tomalla, Gebhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Apparatus for introducing ionizable gas into a plasma of an arc burner. 4,594,496, Cl. 219-121.0PP.

Beck, Earl A. Hydraulic ramp/dock/loader apparatus. 4,593,424, Cl. 14-71.700.

Becker, Erich. Diaphragm pump. 4,594,059, Cl. 417-439.000.

Becker, Manfred G. Method and apparatus for pipe positioning. 4,594,027, Cl. 405-154.000.

Beecham Group p.l.c.: *See*—
Newsome, Peter M.; Mullan, Noel A.; and Marshall, John P., 4,594,195, Cl. 558-412.000.

Beerens, Cornelis J. M. Chain saws and chains therefor. 4,593,591, Cl. 83-834.000.

Begley, Russell D.: *See*—
Upshaw, Clarence W.; Begley, Russell D.; and Reinbold, James F., 4,593,922, Cl. 280-33.99A.

Beiersdorf Aktiengesellschaft: *See*—
Cohnen, Erich; and Armah, Ben, 4,594,419, Cl. 544-311.000.

Beisemann, Heinz: *See*—
Reifenhauser, Hans; Beisemann, Heinz; Reitemeyer, Paul; and Grabowski, Robert, 4,594,063, Cl. 425-141.000.

Bell Helicopter Textron Inc.: *See*—
Cronkhite, James D.; Haas, Thomas J.; and Mort, Raymond W., 4,593,870, Cl. 244-117.00R.

Bellani, Piero; Clavenna, Gaetano; Sosio, Alberta; and Pellegrini, Rinaldo, to RBS Pharma (Roger Bellon Schoum) S.p.A. Imidazopyridine compounds. 4,594,421, Cl. 546-121.000.

Bellini, Mario, to Nippon Gakki Seizo Kabushiki Kaisha. Housing structure of keyboard musical instrument. 4,593,593, Cl. 84-177.000.

Bemis, Claude: *See*—
Smith, Robert F.; and Bemis, Claude, 4,593,880, Cl. 249-91.000.

Ben-Gurion University of the Negev Research and Development Authority: *See*—
Borde, Irena; and Yaron , Yitzhak, 4,593,538, Cl. 62-490.000.

Benadassi, Michel: *See*—
Carte, Michel; Benadassi, Michel; and Dumay, Michel, 4,593,562, Cl. 73-266.000.

Bennett, Brian A. Rotary nibbler. 4,593,465, Cl. 30-240.000.

Bennett, David J.: *See*—
Eijadi, David A.; and Bennett, David J., 4,593,976, Cl. 350-260.000.

Bennett, Ringrose, Wolsfeld, Jarvis, Gardner, Inc.: *See*—
Eijadi, David A.; and Bennett, David J., 4,593,976, Cl. 350-260.000.

Bennett, Robert A., to Specialty Packaging Products, Inc. Spring-piston combination for manually operated pump. 4,593,607, Cl. 92-130.00B.

Benson, Werner: *See*—
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,594,436, Cl. 549-359.000.

Bergandy, Wieslaw, to National Instrument Company, Inc. Filling nozzle valve structure. 4,593,720, Cl. 137-859.000.

Berge, Odd; and Hovland, Helge, to Stord Bartz A/S. Apparatus for the production of fodder and fat from animal raw materials. 4,593,614, Cl. 99-538.000.

Berger, Abe: *See*—
Russell, David B.; Gitlitz, Melvin H.; Leiner, Howard H.; Khuddus, Mo A.; and Berger, Abe, 4,594,365, Cl. 523-122.000.

Berger, Julius, to Hoffmann-La Roche Inc. Animal feed compositions containing the antibiotic X-537A. 4,594,354, Cl. 514-460.000.

Berger, Richard M., to American Filtrona Corporation. Pleated filter and method and apparatus for fabricating same. 4,594,162, Cl. 210-493.100.

Berghof, Hans-Joachim, to Keiper Recaro GmbH & Co. Articulated fitting for vehicle seats. 4,593,952, Cl. 297-365.000.

Bergsteiner, Johann: *See*—
Hoft, Peter; Peter, Wolfgang; Hacke, Heinz; Luhr, Jurgen; Bergsteiner, Johann; Drobe, Wolfgang; Engelke, Fritz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,593,834, Cl. 220-273.000.

Berman, Jody R.: *See*—
Bertram, James L.; Walker, Louis L.; Berman, Jody R.; and Clarke, James A., 4,594,291, Cl. 428-414.000.

Berner, Eckhard, to Dr. Johannes Heidenhain GmbH. Length or angle measuring instrument. 4,593,472, Cl. 33-125.00C.

Bernet, Bernard: *See*—
Coyon, Claude; and Bernet, Bernard, 4,594,280, Cl. 428-135.000.

Bernzweig, David S. Metal detector audio amplifier. 4,594,559, Cl. 330-149.000.

Berta, Dominick A., to Hercules Incorporated. Cross-linking halogenated polymers. 4,594,396, Cl. 525-352.000.

Bertram, James L.; Walker, Louis L.; Berman, Jody R.; and Clarke, James A., to Dow Chemical Company, The. Curable, partially advanced epoxy resins. 4,594,291, Cl. 428-414.000.

Betriebsforschungsinstitut VDEH Institut for Angewandete Forschung GmbH: *See*—
Isselstein, Fritz; Luhn, Ernst; Coen, Gunther; Oberhoff, Dietmar; and Keck, Roland, 4,593,567, Cl. 73-643.000.

Bettarini, Franco: *See*—
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,352, Cl. 514-332.000.
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,451, Cl. 564-44.000.

Betton, Claude, to Spie Batignolles. Apparatus for automatically checking the correspondence between the numerical codes of telephone subscribers and the different transmission and distribution identification codes of the telephone pair assigned to each subscriber. 4,594,480, Cl. 179-175.30R.

Beuhler, Allyson J.: *See*—
Polak, Anthony J.; and Beuhler, Allyson J., 4,594,297, Cl. 429-13.000.

Beutel, Rainer: *See*—
Stahlhofen, Paul; and Beutel, Rainer, 4,594,306, Cl. 430-166.000.

Beyer, Karl H., Jr. Hyperuretic agents. 4,594,349, Cl. 514-255.000.

Bezoari, Massimo D., to Dow Chemical Company, The. Process for metalating polyolefin halides. 4,594,394, Cl. 525-331.500.

Bezoari, Massimo D., to Dow Chemical Company, The. Process for metalating halogenated polyolefins. 4,594,395, Cl. 525-334.100.

Bianchi, Mario; and Barzaghi, Fernando, to Roussel-Uclaf. Derivatives of 4-phenyl-4-oxo-buten-2-oic acid and therapeutic use thereof. 4,594,443, Cl. 560-053.000.

Bieringer, Hermann: *See*—
Bauer, Klaus; Bieringer, Hermann; Burstell, Helmut; and Kocur, Jean, 4,594,098, Cl. 71-86.000.

Bilimoria, Bomi M.: *See*—
Cook, Jerry A.; Garner, Robert H.; Turner, Ralph E., Jr.; and Bilimoria, Bomi M., 4,593,860, Cl. 241-23.000.

Birochik, Valentine L. Method and apparatus for controlling the temperature and pressure of confined substances. 4,593,529, Cl. 62-3.000.

Birrittella, Mark S., to Motorola, Inc. Method for making gallium arsenide NPN transistor with self-aligned base enhancement to emitter region and metal contact. 4,593,457, Cl. 29-576.00B.

Bishop, Frederick T.: *See*—
Kelly, Edward; Bishop, Frederick T.; and Reilly, Donald J., 4,593,747, Cl. 164-496.000.

Bisquolm, Werner: *See*—
Graf, Ralph; and Bisquolm, Werner, 4,593,437, Cl. 19-113.000.

Bissardon, Andre ; Gourlandt, Jean-Pierre; Chastan, Gilles; and Lusseau, Marcel, to CFEC. Self-contained device for sterilizing water. 4,594,154, Cl. 210-105.000.

Bivens, David J., to Bivens Winchester Corporation. Multiple brush carwasher. 4,593,425, Cl. 15-53.0AB.

Bivens Winchester Corporation: *See*—
Bivens, David J., 4,593,425, Cl. 15-53.0AB.

Bizzini, Bernard, to Institut Pasteur. Thiolated polypeptide compound derived from a tetanus toxin fragment, the process for obtaining and its application. 4,594,336, Cl. 514-2.000.

Black Clawson Company, The: *See*—
Blakley, Earl T.; and Marsh, Paul G., 4,593,861, Cl. 241-46.020.

Blackburn, Peggy A.: *See*—
Goel, Anil B.; Tufts, Timothy A.; and Blackburn, Peggy A., 4,594,397, Cl. 525-528.000.

Blaha, Erich, to Carl-Zeiss-Stiftung. Medical examination instrument with headband support. 4,593,683, Cl. 128-23.000.

Blake, Robert J.; and Sokolik, Joseph E., Jr., to Union Carbide Corporation. Method and composition for reducing the strength of ice. 4,594,076, Cl. 44-6.000.

Blakley, Earl T.; and Marsh, Paul G., to Black Clawson Company, The. Apparatus for pulping paper making stock at high consistencies. 4,593,861, Cl. 241-46.020.

Blank, Heinz U.: *See*—
Bonse, Gerhard; Marzolph, Gerhard; and Blank, Heinz U., 4,594,427, Cl. 548-226.000.

Blankenship, Robert M.; and Kowalski, Alexander, to Rohm and Haas Company. Production of core-sheath polymer particles containing voids, resulting product and use. 4,594,363, Cl. 521-64.000.

Blaseck, Klaus, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Arrangement for interconnecting conduits. 4,593,939, Cl. 285-137.100.

Blatnik, William A.: *See*—
Anselmo, John; and Blatnik, William A., 4,593,909, Cl. 273-188.00R.

Blau, Carl C.: *See*—
Myers, Kimbrough I.; Blau, Carl C.; and Taylor, Richard P., 4,593,895, Cl. 271-148.000.

Block, William V.: *See*—
Mahoney, Dennis F.; and Block, William V., 4,594,176, Cl. 252-153.000.

Bloomfield, David P., to Analytic Power Corporation. Electrochemically driven heat pump. 4,593,534, Cl. 62-201.000.

Blunschi, Paul A. Three wheeler mobile pontoons. 4,593,640, Cl. 114-123.000.

Boart International Limited: *See*—
Armstrong, Charles J., 4,593,769, Cl. 173-145.000.

Bock, Mark G.; Evans, Ben E.; Freidinger, Roger M.; and Pitzenberger, Steven M., to Merck & Co., Inc. Process for preparing a benzodiazepinedione derivative. 4,594,191, Cl. 260-239.30P.

Boden, Richard M.; and McGhie, Joseph A., to International Flavors & Fragrances Inc. Methyl phenethyl acetal of 2-butynal. 4,594,464, Cl. 568-592.000.

Boder, Horst, to Sigri GmbH. Graphite electrode for arc furnaces and method for manufacturing same. 4,594,722, Cl. 373-91.000.

Bodine, Paul D., to S. B. Green Partnership. Planters. 4,593,490, Cl. 47-79.000.

Bodor, Nicholas, to Key Pharmaceuticals, Inc. Method for inducing mydriasis in animals. 4,594,356, Cl. 514-534.000.

Boehringer Ingelheim KG: *See*—
Koppe, Herbert; Abele, Wolfgang, deceased; Esser, Franz; Gaida, Wolfram; and Hoefke, Wolfgang, 4,594,344, Cl. 514-222.000.

Boeing Company, The: *See*—
Clark, Kevin E.; and Jones, Richard P., 4,593,476, Cl. 33-529.000.
Nichols, Jack E., 4,593,871, Cl. 244-129.100.
Tesmer, Earl B., 4,594,031, Cl. 408-72.00B.
Weigel, Matthew J., Jr., 4,594,030, Cl. 408-10.000.

Bogner, Martin: *See*—
Scheck, Georg; and Bogner, Martin, 4,593,928, Cl. 280-625.000.

Bohn, Hans; and Winckler, Wilhelm, to Hoechst Aktiengesellschaft. Tissue protein PP_{21}, a process for obtaining it and its use. 4,594,328, Cl. 436-543.000.

Bok, Edward. Installation for floating transport and processing of substrates. 4,594,129, Cl. 156-630.000.

Bonas Machine Company Limited: *See*—
Griffith, John D., 4,593,723, Cl. 139-65.000.

Bond, Irvin D. Inversion cam and cylinder power means. 4,593,573, Cl. 74-104.000.

Bone, Arnold R., to Dennison Manufacturing Company. Dispensing of fasteners. 4,593,844, Cl. 227-67.000.

Bonfiglioli, Giampaolo: *See*—
Ferrari Aggradi, Gian P.; and Bonfiglioli, Giampaolo, 4,593,448, Cl. 29-523.000.
Ferrari Aggradi, Gian P.; and Bonfiglioli, Giampaolo, 4,593,917, Cl. 277-30.000.

Bonitz, Jorg; Entemann, Robert; Miller, Bernhard; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, to Robert Bosch GmbH. Method for detecting engine knock in internal combustion engines. 4,593,553, Cl. 73-35.000.

Bonnerot, Georges: *See*—
Desperben, Lydie; Sari, Hikmet; Morici, Said; and Bonnerot, Georges, 4,594,725, Cl. 375-15.000.

Bonnici, Charles; and Ballard, James W., to Jimco Products. Pressure equalizing roof vent. 4,593,504, Cl. 52-199.000.

Bonse, Gerhard; Marzolph, Gerhard; and Blank, Heinz U., to Bayer Aktiengesellschaft. Preparation of novel 5-acyloxy-4-(5H)-oxazolonium salts suited for use as intermediates for triazinone herbicides. 4,594,427, Cl. 548-226.000.

Boone, Richard K. Supplemental carburetion device. 4,593,671, Cl. 123-572.000.

Boonen, Peter G. T.: *See*—
Stoppels, Doeko; Boonen, Peter G. T.; Enz, Ulrich E.; and van Hoof, Leonardus A. H., 4,594,628, Cl. 360-125.000.

Borcea, Nicky; and Ionescu, Alexandru D. Gripper assembly. 4,593,948, Cl. 294-88.000.

Borch, Richard F., to University of Minnesota, Regents of. Inhibition of undesired effect of platinum compounds. 4,594,238, Cl. 424-10.000.

Borde, Irena; and Yaron , Yitzhak, to Ben-Gurion University of the Negev Research and Development Authority. Refrigeration cycle operatable by low thermal potential energy sources. 4,593,538, Cl. 62-490.000.

Boser, Ronald J.; and Tanaka, Shigeru, to Yoshida Kogyo K. K. Method and apparatus for sewing a slide fastener to fabric pieces. 4,593,635, Cl. 112-265.200.

Boulia, Dorothy I.; Pousson, Michael W., Jr.; Pring, Edward J.; and Stone, Nancy L., to International Business Machines Corporation. Generating and storing electronic fonts. 4,594,674, Cl. 364-523.000.

Bourland, Gordon, Jr.; and Price, Howard M., to LTV Aerospace and Defense Company. Method for installing a septum in honeycomb core. 4,594,120, Cl. 156-155.000.

Bowman, Dennis C.; and Marlowe, James L., to Westinghouse Electric Corp. Electrical bushing having a convertible central conductor. 4,594,475, Cl. 174-152.00R.

Bracht, Roger R.; and Silvey, Dorrel R., to Optical Storage International-U.S. Driver circuit for laser diode. 4,594,717, Cl. 372-38.000.

Bradley, Arthur: *See—*
Pall, David B.; Harwood, Colin F.; Bradley, Arthur; and Brennan, Timothy R., 4,594,202, Cl. 264-8.000.

Bralorne Resources Limited: *See—*
Johnson, Clarence W., 4,593,914, Cl. 277-5.000.

Brandenberg, Winfried, to Westdeutsche Elektrogeratebau GmbH. Time-programming apparatus. 4,594,007, Cl. 368-10.000.

Brander, S. L. Heat sink for an internal combustion engine. 4,593,661, Cl. 123-196.0AB.

Breedis, John F.: *See—*
Caron, Ronald N.; and Breedis, John F., 4,594,221, Cl. 420-485.000.

Brehmer, Horst: *See—*
Elsner, Emil; and Brehmer, Horst, 4,594,113, Cl. 148-12.00B.

Breiholz, Arlen E.; Pool, Robert H.; and Sellers, Glenn W., to Rockwell International Corporation. Aircraft groundspeed measurement system and technique. 4,594,676, Cl. 364-565.000.

Breithaupt, Rupert: *See—*
Kilger, Fridbert; Roth, Siegfried; Breithaupt, Rupert; Menke, Jupp; and Zeifang, Gunter, 4,594,503, Cl. 250-203.00R.

Brennan, Timothy R.: *See—*
Pall, David B.; Harwood, Colin F.; Bradley, Arthur; and Brennan, Timothy R., 4,594,202, Cl. 264-8.000.

Brent, Richard J.: *See—*
Moss, Brian F.; and Brent, Richard J., 4,593,998, Cl. 355-21.000.

Brettle, Jack; Lodge, Kevin J.; Loggie, Nicholas J.; Hughes, Simon M. P.; and Howell, William G., to Plessey Overseas Limited. Conductive gaskets. 4,594,472, Cl. 174-35.0GC.

Brewer, Howard E.; and Lyons, A. William, II, to Sanders Associates, Inc. Multi-column plotter. 4,594,672, Cl. 364-520.000.

Brewer, James S.; and Allen, William P. Convertible ladder stabilizer. 4,593,790, Cl. 182-214.000.

Breymaier, Hermann: *See—*
Sinn, Hartmut; Breymaier, Hermann; and Mutschler, Gunter, 4,593,574, Cl. 74-198.000.

Bridon Plc: *See—*
Yeardley, John K., 4,593,599, Cl. 87-6.000.

Brier, Gordon L., to Eli Lilly and Company. Synergistic antibacterial compositions and method of treatment of infections caused by multiple antibiotic-resistant organisms. 4,594,247, Cl. 424-114.000.

Brigham Young University: *See—*
Robins, Roland K.; and Srivastava, Prem C., 4,594,414, Cl. 536-18.700.
Robins, Roland K.; and Srivastava, Prem C., 4,594,416, Cl. 536-121.000.

Brihier, Gerard C. C., to FACOM. Equilibrating apparatus in particular for motor vehicle wheels. 4,593,564, Cl. 73-473.000.

Briner, Emil: *See—*
Stalder, Herbert; and Briner, Emil, 4,593,521, Cl. 57-328.000.

Brinkmann, Karlheinz: *See—*
Klatt, Alfred; and Brinkmann, Karlheinz, 4,593,606, Cl. 92-52.000.

Bristol-Myers Company: *See—*
Speer, Robert J.; and Stewart, David P., 4,594,418, Cl. 544-225.000.

British Petroleum Company p.l.c., The: *See—*
Fogg, Sidney G.; and Robertson, Frank C., 4,594,383, Cl. 524-510.000.
Othen, David G., 4,594,369, Cl. 523-200.000.

Britten, Allan M. Milk monitoring apparatus and method. 4,593,649, Cl. 119-14.080.

Broadley, Robert E.: *See—*
Gott, Mary L.; and Broadley, Robert E., 4,593,489, Cl. 43-137.000.

Brooks, Lionel H., to Carbomedics, Inc. Bed sampler for a high-temperature fluidized bed. 4,594,270, Cl. 427-213.000.

Browder, Lewis B., to Datatape Incorporated. Faraday-effect magneto-optic transducer apparatus of a rotary form. 4,594,699, Cl. 369-13.000.

Brown, Chris W.; Maris, Mark A.; Lavery, Donald S.; Caputo, Bernard; and Model, Mark. Heat energy measuring system. 4,594,510, Cl. 250-339.000.

Brown, David C.; Engebretson, Harold J.; and Watson, Fred L., to Applied Technologies Associates. Apparatus and method to communicate bidirectional information in a borehole. 4,593,559, Cl. 73-151.000.

Brown, Margie E.: *See—*
Brown, William C., Jr.; and Brown, Margie E., 4,593,417, Cl. 2-209.100.

Brown, Milton F., Jr. Impact sensor. 4,594,485, Cl. 200-61.45R.

Brown, Richard A.; Norris, Robert D.; and Richards, Joseph C., to FMC Corporation. Method for liquifying chloride-based heavy brine well completion fluids. 4,594,170, Cl. 252-8.55R.

Brown, William C., Jr.; and Brown, Margie E. Convertible survival cap. 4,593,417, Cl. 2-209.100.

Browning, James A. Method and apparatus for high velocity flame spraying of asymmetrically fed wire rods. 4,593,856, Cl. 239-83.000.

Bruch, Guy. Vinification apparatus. 4,593,611, Cl. 99-277.100.

Bruder, Gerhard; and Pippinger, Horst, to Elba-Werk Maschinengesellschaft mbH & Co. Mobile apparatus for mixing and loading concrete. 4,594,046, Cl. 414-332.000.

Bruker Analytische Messtechnik GmbH: *See—*
Simon, Arno; and Gast, Jurgen, 4,594,509, Cl. 250-338.000.

Brule, Paul L., to LaRos Equipment Company, Inc. Belt separator for blow molding parts. 4,593,821, Cl. 209-620.000.

Brunner, Rudolf, to Heilmeier & Weinlein, Fabrik fur Oel-Hydraulik GmbH & Co., KG. Hydraulic pump unit. 4,594,056, Cl. 417-271.000.

Bsr, Ltd.: *See—*
Jachno, Alex, 4,594,010, Cl. 400-124.000.

Buchner, Delmer B. Cartridge assembly. 4,593,621, Cl. 102-430.000.

Buckle, Ian G., to Development Finance Corporation of New Zealand. Energy absorbers. 4,593,502, Cl. 52-167.000.

Buddenbaum, Christian H.: *See—*
Mundelius, Kevin G.; and Buddenbaum, Christian H., 4,594,038, Cl. 409-205.000.

Buhler, Eugen. Method and apparatus for freeing a pattern or shaping element from foundry material. 4,593,740, Cl. 164-44.000.

Bullock, Joseph J., to Bankers Trust Company. Tamper-resistant container closure having auxiliary removal features. 4,593,830, Cl. 215-256.000.

Bunce, Roger A.: *See—*
Whitehead, Thomas P.; Thorpe, Gary H. G. H.; Kricka, Larry J.; Gibbons, John E. C.; and Bunce, Roger A., 4,593,728, Cl. 141-98.000.

Burba, John L., III; and Wolcott, Richard A., to Dow Chemical Company, The. Transition metal aluminates. 4,594,335, Cl. 502-324.000.

Burger, Albert J.: *See—*
Terry, Edmund A.; Burger, Albert J.; and Terry, Peter A., 4,593,545, Cl. 70-269.000.

Burgess, Gary L.: *See—*
Leblanc, Yvon N.; Zemelman, Valery B.; and Burgess, Gary L., 4,594,257, Cl. 426-594.000.
Vitti, Rudolf A.; Burgess, Gary L.; and Zemelman, Valery B., 4,594,258, Cl. 426-594.000.
Zemelman, Valery B.; Burgess, Gary L.; Vitti, Rudolf A.; Forman, Todd M.; Batchelor, Anthony M.; and Leblanc, Yvon N., 4,594,256, Cl. 426-594.000.

Burgess, W. D.; Lytton, Glenn E.; and Nash, Ronald S., to Fiber Controls Corporation. Baffled webformer and system. 4,593,436, Cl. 19-105.000.

Burke, Edward M., to Grayco Specialist Tank, Inc. Carbon dioxide well injection method. 4,593,763, Cl. 166-302.000.

Burke, Thomas J. Boxing robot. 4,593,900, Cl. 272-76.000.

Burke, Timothy M., to Motorola, Inc. General purpose data control terminal. 4,594,591, Cl. 340-825.070.

Burlington Northern Railroad Company: *See—*
Fink, James K.; and Habel, David H., 4,593,536, Cl. 62-239.000.

Burnham, Robert D.: *See—*
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,594,718, Cl. 372-45.000.

Burroughs Corporation: *See—*
Kearns, Peter J. M., 4,593,935, Cl. 282-28.00R.
Steckler, Thomas M., 4,594,658, Cl. 364-200.000.

Burroughs Wellcome Co.: *See—*
Rao, Leburu S., 4,594,241, Cl. 424-38.000.

Burstell, Helmut: *See—*
Bauer, Klaus; Bieringer, Hermann; Burstell, Helmut; and Kocur, Jean, 4,594,098, Cl. 71-86.000.

Busche, Alan C.: *See—*
Gumb, Beverley W.; Freeman, Raymond C.; and Busche, Alan C., 4,594,478, Cl. 179-103.000.

Bushard, Louis B.: *See—*
Schomburg, John R.; and Bushard, Louis B., 4,594,680, Cl. 364-765.000.

Bustos, Rafael T., to Leggett & Platt, Incorporated. Display rack with improved shelf mounts. 4,593,826, Cl. 211-187.000.

Butler-Smith, Paul W. Rotary drill chuck with belleville spring biased jaws which are centrifugally balanced. 4,593,919, Cl. 279-4.000.

Butterworth, Inc.: *See—*
Pacht, Amos, 4,593,858, Cl. 239-126.000.

Byrd, Lucid L., to Allied Tube & Conduit Corporation. Strip preparation rollers. 4,593,550, Cl. 72-199.000.

Byrns, John P., to Motorola, Inc. Semaphore for memory shared by two asynchronous microcomputers. 4,594,657, Cl. 364-200.000.

C. Reichert Optische Werke AG: *See—*
Schindl, Klaus P.; and Puxkandl, Peter B., 4,593,979, Cl. 350-514.000.

Cabeza, Maximino R. Headset for bicycles. 4,593,924, Cl. 280-279.000.

Cahill, Joseph, Jr.; and Harris, Eugene G., to National Distillers and Chemical Corporation. Process for the depolymerization of polyesters using dawsonite as the catalyst. 4,594,434, Cl. 549-267.000.

Calgon Carbon Corporation: *See—*
Sutt, Robert F., Jr., 4,594,163, Cl. 210-660.000.

Calgon Corporation: *See—*
Kirwin, Ross C., 4,594,268, Cl. 427-136.000.

Calvert, Peter W., to Thomas Industries, Inc. Roller paint guard assembly. 4,593,428, Cl. 15-248.00A.

Camco Inc.: *See—*
St. Louis, Robert M., 4,593,441, Cl. 24-297.000.

Campanini, Sergio, to Hose America, Inc. Air brake valve system. 4,593,954, Cl. 303-7.000.

Campbell Soup Company: *See—*
Huddle, Herbert C., 4,593,805, Cl. 198-381.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Wright, David A., 4,593,815, Cl. 206-389.000.

Canadian Fram Limited: *See*—
Yew, Kwang, 4,593,798, Cl. 192-0.033.

Canadian Patents and Development Limited: *See*—
Lautenschlaeger, Friedrich K., 4,594,250, Cl. 426-257.000.

Canon Kabushiki Kaisha: *See*—
Adachi, Hideki; Tomosada, Masahiro; Hirose, Masayuki; Miyata, Masanori; and Komiya, Yutaka, 4,593,999, Cl. 355-55.000.
Aoki, Takao; and Ushioda, Keisaku, 4,593,991, Cl. 355-14.00D.
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,594,618, Cl. 360-73.000.
Saito, Tetsuro; and Komura, Akihiko, 4,594,482, Cl. 200-5.00A.
Shinbori, Kenichi; and Ishikawa, Kazuo, 4,594,613, Cl. 358-213.000.
Tezuka, Nobuo, 4,594,617, Cl. 360-73.000.
Yoshinaga, Kenji; and Takada, Yusaku, 4,593,992, Cl. 355-3.0FU.

Caprioli, Vincenzo: *See*—
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,352, Cl. 514-332.000.
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,451, Cl. 564-44.000.

Caputo, Bernard: *See*—
Brown, Chris W.; Maris, Mark A.; Lavery, Donald S.; Caputo, Bernard; and Model, Mark, 4,594,510, Cl. 250-339.000.

Carabet, George F.: *See*—
Rotondi, Anthony J.; Mullich, Richard O.; and Carabet, George F., 4,593,542, Cl. 70-134.000.

Caravelle Industries, Inc.: *See*—
Chrisley, Barney D., 4,593,426, Cl. 15-84.000.

Carbomedics, Inc.: *See*—
Brooks, Lionel H., 4,594,270, Cl. 427-213.000.

Carl-Zeiss-Stiftung: *See*—
Blaha, Erich, 4,593,683, Cl. 128-23.000.

Carlson, James A.; and Stoddard, Lawrence M., to United States of America, Energy. Alarm sensor apparatus for closures. 4,593,491, Cl. 49-13.000.

Caron, Ronald N.; and Breedis, John F., to Olin Corporation. Multipurpose copper alloys with moderate conductivity and high strength. 4,594,221, Cl. 420-485.000.

Carruthers Equipment Co.: *See*—
Graham, Belvin L., 4,594,066, Cl. 425-151.000.

Carson, Don B.: *See*—
James, Robert B., Jr.; and Carson, Don B., 4,594,144, Cl. 208-62.000.

Carte, Michel; Benadassi, Michel; and Dumay, Michel, to FLONIC. Gas meter. 4,593,562, Cl. 73-266.000.

Caruso, Mark B.; and Scranton, Robert A., to International Business Machines Corporation. Long tube bender element squeeze bearing. 4,593,956, Cl. 384-1.000.

Caspersen, Sverre: *See*—
Lien, Eldar K.; and Caspersen, Sverre, 4,594,696, Cl. 367-144.000.

Castolin S.A.: *See*—
Simm, Wolfgang; and Steine, Hans-Theo, 4,594,103, Cl. 75-128.00C.

Catherwood, Robert, Sr., to Harris Corporation. Dehydrating air-filtering apparatus. 4,594,082, Cl. 55-316.000.

Cattaneo, Filippo; and Perrone, Agostino, to Innse Innocenti Santeustacchio S.p.A. Equipment for the lateral transference of pipes. 4,593,807, Cl. 198-457.000.

Caudy, Don W.: *See*—
Hackman, Donald J.; Caudy, Don W.; and Nikodem, Leslie F., 4,593,885, Cl. 254-277.000.

Caugherty, William C. Die casting apparatus. 4,593,741, Cl. 164-337.000.

Caumont, Jean P.: *See*—
Schawann, Jean C.; Caumont, Jean P.; and Falcimaigne, Jean, 4,593,937, Cl. 285-18.000.

Cavalleri, Bruno: *See*—
Strazzolini, Paolo; Malabarba, Adriano; and Cavalleri, Bruno, 4,594,187, Cl. 530-332.000.

Cavanaugh, Timothy: *See*—
Rivas, Andrew; Rivas, Robert; Pace, James; and Cavanaugh, Timothy, 4,593,912, Cl. 273-339.000.

Cesna, Joseph V., to Speedfam Corporation. Control valve assembly for abrasive slurry. 4,593,716, Cl. 137-561.00A.

CFEC: *See*—
Bissardon, Andre ; Gourlandt, Jean-Pierre; Chastan, Gilles; and Lusseau, Marcel, 4,594,154, Cl. 210-105.000.

CGR MeV: *See*—
Aucouturier, Jeanne; and Leboutet, Hubert, 4,594,530, Cl. 315-5.410.

Chabot, Paul-Andre . Automatic damper for chimney flue. 4,593,610, Cl. 98-74.000.

Chalkley, Michael E.: *See*—
Weir, Donald R.; Kerfoot, Derek E.; and Chalkley, Michael E., 4,594,102, Cl. 75-119.000.

Chamuel, Jacques R., to Charles Stark Draper Laboratory, Inc., The. Apparatus for nondestructive workpiece inspection employing thermoelastically and electrodynamically induced elastic waves. 4,593,565, Cl. 73-601.000.

Chandler, Gregg; and Rajaram, Babu, to Zenith Electronics Corporation. Character oriented RAM mapping system and method therefor. 4,594,587, Cl. 340-750.000.

Chandra, Rangasami S.; Quen, Stephen G.; Eineichner, Donald E.; and Lastra, Jorge E., to FMC Corporation. Well production control system. 4,594,665, Cl. 364-422.000.

Chaney, John P.; and Van De Nobelen, William, to Smith International, Inc. Two-piece pressure relief valve. 4,593,775, Cl. 175-228.000.

Chang, Clarence D.; and Chu, Cynthia T. W., to Mobil Oil Corporation. Zeolite modification. 4,594,333, Cl. 502-71.000.

Chang, Pei-Ching; and Paszner, Laszlo. Pulping of lignocellulose with aqueous alcohol and alkaline earth metal salt catalyst. 4,594,130, Cl. 162-16.000.

Chapin, John T.; and Sabia, Raffaele A., to AT&T Bell Laboratories. Elastomeric controlled release formulation and article comprising same. 4,594,380, Cl. 524-144.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Chamuel, Jacques R., 4,593,565, Cl. 73-601.000.

Chastan, Gilles: *See*—
Bissardon, Andre ; Gourlandt, Jean-Pierre; Chastan, Gilles; and Lusseau, Marcel, 4,594,154, Cl. 210-105.000.

Chembakaffery, George M.: *See*—
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., 4,593,726, Cl. 140-89.000.
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., 4,593,809, Cl. 198-624.000.

Cheng, Chia C.: *See*—
Zee-Cheng, Robert K.; and Cheng, Chia C., 4,594,346, Cl. 514-237.000.

Cheng, Shang-I. Integrated coal liquefaction, gasification and electricity production process. 4,594,140, Cl. 208-414.000.

Chester, Arthur W.; and Chu, Yung-Feng, to Mobil Oil Corporation. Conversion with zeolite catalysts prepared by steam treatment. 4,594,146, Cl. 208-111.000.

Cheung, Derek T., to Rockwell International Corporation. Pyroelectric thermal detector array. 4,593,456, Cl. 29-573.000.

Cheung, Harry, to Union Carbide Corporation. Hybrid nitrogen generator with auxiliary reboiler drive. 4,594,085, Cl. 62-25.000.

Cheung, Yak-Fa; Thorsett, Eugene D.; and Patchett, Arthur A., to Merck & Co., Inc. Perhydro-1,4-thiazepin-5-one and perhydro-1,4-thiazocin-5-one derivatives as antihypertensives. 4,594,341, Cl. 514-211.000.

Chevron Research Company: *See*—
Goodman, Jack E.; and Schmadel, Donald C., 4,593,969, Cl. 350-96.190.

Chi Yu, Simon S. Venetian blind. 4,593,738, Cl. 160-176.00R.

Chiappini, Giuseppe: *See*—
Vittone, Andrea; Chiappini, Giuseppe; and Di Paola, Massimo, 4,594,210, Cl. 264-70.000.

Chichibu Cement Co., Ltd.: *See*—
Minegishi, Keiichi; Akiba, Tokuji; Katayama, Keiichi; and Machida, Hiroshi, 4,594,209, Cl. 264-66.000.
Suzuki, Osamu; Ishizaki, Kanjiro; and Ozawa, Seiichi, 4,594,513, Cl. 250-506.100.

China Metallurgical Imp. & Exp. Corp.: *See*—
Chunshan, Pan, 4,593,751, Cl. 165-9.100.

Chino, John J.: *See*—
Kouroupis, John; and Chino, John J., 4,593,626, Cl. 108-4.000.

Chiu, Tin-Ho: *See*—
Nyilas, Emery; and Chiu, Tin-Ho, 4,594,407, Cl. 528-272.000.

Chokai, Shoichi: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Murase, Masao; Inoue, Kichiro; and Shirahase, Ichiro, 4,594,345, Cl. 514-234.000.

Chong, Berni P.; and Isacoff, Eric G., to Rohm and Haas. Filter aid materials bearing anion exchange resins. 4,594,158, Cl. 210-193.000.

Chown, Peter A. C. Load carrying unit. 4,593,840, Cl. 224-42.03A.

Chrisley, Barney D., to Caravelle Industries, Inc. Litter collection apparatus. 4,593,426, Cl. 15-84.000.

Christe, Karl O.: *See*—
Schack, Carl J.; and Christe, Karl O., 4,594,232, Cl. 423-293.000.

Christian, Paul: *See*—
Kroll, Walter; and Christian, Paul, 4,594,081, Cl. 55-222.000.

Christie, Alan E.: *See*—
Jenkner, Wolfgang R.; Christie, Alan E.; Elsayed, Emad E. M.; Griffiths, John S.; and Mentes, Guney A., 4,594,024, Cl. 405-127.000.

Chu, Cynthia T. W.: *See*—
Chang, Clarence D.; and Chu, Cynthia T. W., 4,594,333, Cl. 502-71.000.

Chu, Yung-Feng: *See*—
Chester, Arthur W.; and Chu, Yung-Feng, 4,594,146, Cl. 208-111.000.

Chunshan, Pan, to China Metallurgical Imp. & Exp. Corp.; and Paul Wurth S.A. Chequer-brick for vertical cowpers and cowper chequerwork constructed from these chequer-bricks. 4,593,751, Cl. 165-9.100.

Ciba-Geigy AG: *See*—
Moss, Brian F.; and Brent, Richard J., 4,593,998, Cl. 355-21.000.

Ciba-Geigy Corporation: *See*—
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,594,400, Cl. 526-255.000.
Orban, Ivan, 4,594,444, Cl. 560-067.000.
Schenkenberger, Ernst, 4,594,075, Cl. 8-499.000.
Schurter, Rolf; Fory, Werner; and Meyer, Willy, 4,594,097, Cl. 71-93.000.

Cielo, John R.: *See*—
Barclay, Terry W.; Cielo, John R.; Martin, William J.; and Trushell, James B., 4,594,588, Cl. 340-771.000.

Circello, Joseph C.: *See*—
Guenthner, Russell W.; Edgington, Gregory C.; Trubisky, Leonard G.; and Circello, Joseph C., 4,594,660, Cl. 364-200.000.
Circle Iron Work Co., Ltd.: *See*—
Mikawa, Isao; Endoh, Masahiro; Kaji, Masayuki; Kishida, Yoshitaka; and Yamamoto, Nobuhiro, 4,593,632, Cl. 111-3.000.
Ciszek, Theodore F.; and Hurd, Jeffery L., to Sachs, Emanuel M. Apparatus for melt growth of crystalline semiconductor sheets. 4,594,229, Cl. 422-246.000.
Citizen Watch Co., Ltd.: *See*—
Koenuma, Sukeo, 4,593,842, Cl. 224-179.000.
Claar, Klaus; Heimbrodt, Klaus-Juergen; and Kurth, Hermann, to Daimler-Benz Aktiengesellschaft. Central locking system with two-door control for motor vehicles. 4,593,544, Cl. 70-264.000.
Clairol Incorporated: *See*—
Goeller, Loretta D.; and Skovdal, Jorgen, 4,593,708, Cl. 132-9.000.
Clark, Daniel O.; Damrow, Paul A.; and Tsang, Floris Y., to Dow Chemical Company, The. Elongated tubesheets for hollow fiber type battery cells and method of fabricating the same. 4,594,289, Cl. 428-368.000.
Clark, Kevin E.; and Jones, Richard P., to Boeing Company, The. Computer aided adjustable tube checking fixture system. 4,593,476, Cl. 33-529.000.
Clarke, James A.: *See*—
Bertram, James L.; Walker, Louis L.; Berman, Jody R.; and Clarke, James A., 4,594,291, Cl. 428-414.000.
Clarkson, Andrew P.; Flanders, James R.; and Price, Frank C., to USM Corporation. Lasting heel seat and side portions of a shoe. 4,593,423, Cl. 12-145.000.
Clavenna, Gaetano: *See*—
Bellani, Piero; Clavenna, Gaetano; Sosio, Alberta; and Pellegrini, Rinaldo, 4,594,421, Cl. 546-121.000.
Clement, Jean-Joseph; and Lafuente, Claude A., to Les Cables de Lyon. Centering cell for connecting optical fibers. 4,593,971, Cl. 350-96.200.
Clemente, Ralph, to RCA Corporation. Blind structure including remote slat moving means. 4,593,737, Cl. 160-84.00R.
Clinton, William D.; and Hess, Donald J., to Clinton, William D. Desludging device for centrifuges. 4,594,166, Cl. 210-107.000.
Clive-Smith, Martin. Containers. 4,593,831, Cl. 220-1.500.
Coats, Joel R., to Iowa State University Research Foundation & Inc. Chloronitroalkane insecticides. 4,594,360, Cl. 514-716.000.
Cochran, Steven M.; and Murphy, Mark J. Arrangement and method for achieving an aerodynamic mast profile for sailcraft. 4,593,638, Cl. 114-39.000.
Cockerill Sambre S.A.: *See*—
Lemaire, Jean-Paul E.; and Renard, Lucien P., 4,594,266, Cl. 427-55.000.
Coen, Gunther: *See*—
Isselstein, Fritz; Luhn, Ernst; Coen, Gunther; Oberhoff, Dietmar; and Keck, Roland, 4,593,567, Cl. 73-643.000.
Cohen, Ira M. Turbulence reducing gutter system for swimming pools. 4,593,421, Cl. 4-507.000.
Cohen, William R.; and Gillberg, James E., to RCA Corporation. Power down sensor. 4,594,517, Cl. 307-296.00R.
Cohnen, Erich; and Armah, Ben, to Beiersdorf Aktiengesellschaft. Substituted 5-phenylthio-6-amino-pyrimidinones, a process for their preparation and their use, and formulations containing these compounds. 4,594,419, Cl. 544-311.000.
Coker, Curtis D.: *See*—
Paspek, Stephen C., Jr.; and Coker, Curtis D., 4,594,141, Cl. 208-390.000.
Colby, John: *See*—
Dalton, Howard; Colby, John; and Stirling, David I., 4,594,324, Cl. 435-123.000.
Coleman, Charles R.; and Rukavina, Thomas G., to PPG Industries, Inc. Long chain hydrocarbon and fluorocarbon reactive internal release agents for condensation polymers. 4,594,402, Cl. 528-49.000.
Colle, Roberto; Gozzo, Franco; and Mirenna, Luigi, to Montedison S.p.A. Azolyl-furan-derivatives having fungicide activity. 4,594,353, Cl. 514-383.000.
Collins, Ian P., to Warner-Lambert Technologies, Inc. Connector device for an endoscope. 4,593,679, Cl. 128-4.000.
Combustion Engineering, Inc.: *See*—
Teigen, Bard C., 4,593,630, Cl. 110-245.000.
Comeau, Laurier J., to NL Sperry-Sun of Canada, Ltd. Tubing-conveyed external gauge carriers. 4,593,771, Cl. 175-48.000.
Commissariat a l'Énergie Atomique: *See*—
Feutrel, Claude, 4,594,216, Cl. 376-442.000.
Commonwealth of Australia, The: *See*—
Varga, Istvan K., 4,594,553, Cl. 324-454.000.
Commonwealth of Puerto Rico: *See*—
Font, Linda T., 4,593,910, Cl. 273-273.000.
Communications Systems, Inc.: *See*—
Meyer, Daniel, 4,593,966, Cl. 339-205.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Ollivier, Yves, 4,594,704, Cl. 370-16.000.
Compagnie Industrielle Radioelectrique: *See*—
Sidler, Thomas; and Gasser, Daniel, 4,594,514, Cl. 250-556.000.
Conax Buffalo Corporation: *See*—
Rhodes, Geoffrey M., 4,593,970, Cl. 350-96.200.
Concept, Inc.: *See*—
Lindstrom, Judy; Ector, W. Lane, Jr.; and Trott, Arthur F., 4,593,691, Cl. 128-303.140.
Congdon, James S., to Genrad, Inc. High-switching-speed d.c. amplifier with input-offset current compensation. 4,594,558, Cl. 330-9.000.
Conoco Inc.: *See*—
Lilienthal, Walter B., 4,593,764, Cl. 166-312.000.
Conrad, Peter G., to Sobstad Sailmakers, Inc. Method of stress distribution in a sail and sail construction. 4,593,639, Cl. 114-103.000.
Continuous Casting Systems Inc.: *See*—
McVay, James D.; and Take, Hermann, 4,593,743, Cl. 164-416.000.
Control Data Corporation: *See*—
Van Hatten, David A.; and Nielsen, Herman T., 4,594,590, Cl. 340-825.510.
Conway, Charles S. Immiscible fluid separation apparatus. 4,594,155, Cl. 210-115.000.
Cook, Gregory: *See*—
Stafford, Robert; and Cook, Gregory, 4,593,710, Cl. 135-102.000.
Cook, Jerry A.; Garner, Robert H.; Turner, Ralph E., Jr.; and Bilimoria, Bomi M., to Anglo American Clays Corporation. Method for improving handleability of calcined kaolin clay products. 4,593,860, Cl. 241-23.000.
Cook, John A.; Park, George B.; and McLoughlin, Robert H., to Raychem Corporation. Electrode article. 4,594,299, Cl. 429-129.000.
Cook, Kenneth, to Hydraroll Limited. Mechanical handling apparatus. 4,593,810, Cl. 198-781.000.
Cook, Melvin S. Growth of thin epitaxial films on moving substrates from flowing solutions. 4,594,126, Cl. 156-608.000.
Cook, Melvin S. Liquid phase epitaxy. 4,594,128, Cl. 156-622.000.
Cook, Thomas E.; Dyer, John C.; and Venegas, Manuel G., to Procter & Gamble Company, The. Chlorine bleach compatible liquid detergent compositions. 4,594,184, Cl. 252-542.000.
Coonan, Edmund C. Liquid phase cleaner-solvent. 4,594,111, Cl. 134-3.000.
Cooper, David E.; and Gallagher, Thomas F., to SRI International. Method and apparatus for double modulation spectroscopy. 4,594,511, Cl. 250-339.000.
Cooper, Paul: *See*—
Albrecht, Ernest E.; and Cooper, Paul, 4,593,597, Cl. 84-487.000.
Cooper, Richard P.: *See*—
Alameda, Robert; and Ash, Raymond, 4,593,516, Cl. 53-75.000.
Copeland, James L., to Economics Laboratory, Inc. Mechanical dishwashing rinse composition having a low foaming sulfonic acid rinsing agent, a hydrotrope and a source of active halogen. 4,594,175, Cl. 252-99.000.
Copolymer Rubber & Chemical Corporation: *See*—
Olivier, Errol J., 4,594,386, Cl. 525-66.000.
Cordis Corporation: *See*—
Barreras, Francisco J., 4,594,565, Cl. 331-108.00A.
Corey, John A.; and Walsh, Michael M., to Mechanical Technology Incorporated. Lightweight piston-rod assembly for a reciprocating machine. 4,593,608, Cl. 92-176.000.
Cormack, Alexander D.: *See*—
Hooper, Anthony W.; and Cormack, Alexander D., 4,594,045, Cl. 414-325.000.
Cornell, Charles R., to J. I. Case Company. Transmission monitor/control microprocessor for continuously variable power train. 4,594,666, Cl. 364-424.100.
Cornell, David D.: *See*—
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,594,445, Cl. 560-103.000.
Cornwell, David G.: *See*—
Grodinsky, Robert M.; and Cornwell, David G., 4,594,561, Cl. 330-297.000.
Cory, Richard, to Doyle, Bruce R., a part interest. Orbiting action device. 4,593,911, Cl. 273-322.000.
Cosman, Eric R. Telemetric differential pressure sensor with the improvement of a conductive shorted loop tuning element and a resonant circuit. 4,593,703, Cl. 128-748.000.
Cosmo, Nicola, to AMP Incorporated. Electrical compression connector. 4,593,961, Cl. 339-61.00M.
Costa, Jorge; and Reichel, Wolfgang, to Hermes Precisa International S.A. Sheet feed device for a printer or typewriter. 4,594,013, Cl. 400-625.000.
Cotter, Robert J.: *See*—
Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., 4,594,404, Cl. 528-174.000.
Council of Governors of the United Medical and Dental Schools of Guy's and St. Thomas's Hospitals: *See*—
Lehner, Thomas; and Giasuddin, Abu S. M., 4,594,244, Cl. 424-87.000.
Coursolle, Thomas P.; and Murphy, Patrick J., to Rosemount Inc. Light modulation sensor in a vortex shedding flowmeter. 4,594,504, Cl. 250-227.000.
Cowan, Norman M.: *See*—
Seger, Harold C.; and Cowan, Norman M., 4,593,915, Cl. 277-12.000.
Cowell, Robert L., to Mattel, Inc. Infant's soft, simulated auto dashboard. 4,594,072, Cl. 446-227.000.
Cox, Frank T., Jr. Inclined disc brake assembly. 4,593,795, Cl. 188-71.300.
Cox, Percy T.; Warren, Wayne F.; and Nussbaum, Theodore W., to Texaco Inc. Method of deep penetration well logging using three receivers. 4,594,551, Cl. 324-341.000.
Coyon, Claude; and Bernet, Bernard, to La Metal Deploye. Expanded perforated sheet having integral unexpanded sides and method of manufacturing the same. 4,594,280, Cl. 428-135.000.
Craig, Thomas A.: *See*—
Grassl, Roman; Craig, Thomas A.; and Weil, Eric P., 4,594,487, Cl. 200-82.00E.

Cravey, Wesley E.: *See—*
Roof, Glenn L.; Porlier, Beth W.; and Cravey, Wesley E., 4,594,147, Cl. 208-207.000.
Creative Products Resource Associates, Ltd.: *See—*
Smith, James A.; and Murphy, Betty J., 4,594,362, Cl. 521-52.000.
Criss, Russell C.: *See—*
Gillery, F. Howard; and Criss, Russell C., 4,594,137, Cl. 204-192.0SP.
Cronkhite, James D.; Haas, Thomas J.; and Mort, Raymond W., to Bell Helicopter Textron Inc. Energy absorbing composite aircraft structure. 4,593,870, Cl. 244-117.00R.
Csonka, Laszlo N.; and Valentine, Raymond C., to University of California, The Regents of the. Hybrid DNA conferring osmotic tolerance. 4,594,323, Cl. 435-107.000.
Cudnohufsky, Gerald G., to Programmable Tracing Incorporated. Tracer control circuit for machine tools. 4,593,586, Cl. 82-14.00A.
Culley, Paul R.; and Wallace, Steven J., to Texas Instruments Incorporated. Pulse width modulation of printhead voltage. 4,594,501, Cl. 219-492.000.
Culp, Eugene H.: *See—*
Oblizajek, Kenneth L.; Lauer, Cornelius; and Culp, Eugene H., 4,593,557, Cl. 73-146.000.
Cummins Engine Company, Inc.: *See—*
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Curatolo, Frank. Extrusion. 4,593,508, Cl. 52-239.000.
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Tam, Matthias L.; and Custode, Frank Z., 4,593,453, Cl. 29-571.000.
Cuvar, Christina L.; and Cuvar, Robert P. Pierced earring with slidable plastic post and backing. 4,593,540, Cl. 63-12.000.
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Stich, Bodo; Hassler, Ernst; Adamowicz, Slawomir; and Cyphelly, Ivan J., 4,593,715, Cl. 137-503.000.
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Daiwa Seiko Inc.: *See—*
Yasui, Kuniharu; and Kaneko, Kyoichi, 4,593,869, Cl. 242-220.000.
d'Alayer de Costemore d'Arc, Stephane M., to Allsop, Inc. Cassette cleaning device. 4,594,629, Cl. 360-128.000.
Dalton, Howard; Colby, John; and Stirling, David I., to National Research Development Corp. Microbiological process for oxidizing organic compounds. 4,594,324, Cl. 435-123.000.
Damrow, Paul A.: *See—*
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Danko, Donald M., Jr., to S. K. Wellman Company, The. Friction material. 4,593,802, Cl. 192-107.00M.
Danly Machine Corporation: *See—*
Heiberger, Francis E., 4,593,547, Cl. 72-1.000.
Dantzig, Jonathan A.: *See—*
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,594,117, Cl. 148-414.000.
Darmara, Falih. Method and apparatus for producing sound castings. 4,593,746, Cl. 164-495.000.
Datatape Incorporated: *See—*
Browder, Lewis B., 4,594,699, Cl. 369-13.000.
Davies, David L., to Micro Control Systems, Inc. Portable three dimensional graphics tablet. 4,593,470, Cl. 33-1.0CC.
Davis, James A., to Firestone Tire & Rubber Company, The. Method for improved metal adhesion and metal adhesion retention. 4,594,381, Cl. 524-396.000.
Davis, Robert C. B., to Rubery Owen-Rockwell Limited. Running gear for a trailer vehicle. 4,593,930, Cl. 280-690.000.
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Degussa Aktiengesellschaft: *See—*
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Dell, Hans-Dieter; Pelster, Bernhard; Kraus, Reinhold; and Schierstedt, Detlef, to Troponwerke GmbH & Co. Depot antiinflammatory agents. 4,594,357, Cl. 514-537.000.
de Lorenzi, Silvano, to MADAG Maschinen-und Apparatebau Dietikon AG. Dabber printing machine with plural dabbers. 4,593,616, Cl. 101-163.000.
Delourme, Raymond; Detienne, Jean-Louis; Komornicki, Jacques; and Tellier, Jacques, to Societe Nationale Elf Aquitaine (Production). Flotation of minerals. 4,594,151, Cl. 209-166.000.
DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, to Wisconsin Alumni Research Foundation. 2α-fluorovitamin D_3. 4,594,192, Cl. 260-397.200.
Denise, Rene ; and Moreau, Francis, to Societe d'Etude et de Construction de Meteurs d'Aviation S.N.E.C.M.A. Welding ring. 4,593,938, Cl. 285-22.000.
Dennison Manufacturing Company: *See—*
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Depcik, Hans-Werner: *See—*
Heidenreich, Klaus; Depcik, Hans-Werner; and Radojewski, Hans, 4,594,204, Cl. 264-25.000.
Depeault, Marcel. Apparatus for mixing and pumping slurry. 4,594,006, Cl. 366-266.000.
Derus, Gene A. Flush valve control for water closet. 4,593,419, Cl. 4-324.000.
Desperben, Lydie; Sari, Hikmet; Moridi, Said; and Bonnerot, Georges, to U.S. Philips Corporation. Combined adaptive equalization and demodulation circuit. 4,594,725, Cl. 375-15.000.
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Popp, Franz-Wolfgang; and Velten, Reinhold, 4,594,214, Cl. 376-272.000.
Devaney, Anthony J., to Schlumberger Technology Corporation. Diffraction tomography systems and methods with fixed detector arrays. 4,594,662, Cl. 364-400.000.
Development Finance Corporation of New Zealand: *See—*
Buckle, Ian G., 4,593,502, Cl. 52-167.000.
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de Vrijer, Bertus, to U.S. Philips Corporation. Metal halide discharge lamp. 4,594,529, Cl. 313-571.000.
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DeYoung, Russell J., to United States of America, National Aeronautics and Space Administration. Long gain length solar pumped box laser. 4,594,720, Cl. 372-79.000.
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Diebold, Incorporated: *See—*
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Dieffenbacher, Albrecht, to Nestec S.A. Fat fractionation. 4,594,194, Cl. 260-428.000.
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Dillingham, Richard F. Necktie travel case. 4,593,812, Cl. 206-292.000.
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DiMarco, Bernard; and Stanford, Charles W., to Siemens-Allis, Inc. Circuit breaker contact arm assembly having a magnetic carrier. 4,594,567, Cl. 335-16.000.
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Dingler, Hermann P. A. Method and apparatus for cleaning a reusable litter contained within a litter box. 4,593,645, Cl. 119-1.000.
Dingwall, Andrew G. F.; and Zazzu, Victor, to RCA Corporation. Precision setting of the bias point of an amplifying means. 4,594,560, Cl. 330-296.000.
Di Paola, Massimo: *See—*
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Dippert, Louis A. Adjustable light. 4,594,647, Cl. 362-376.000.
Director-General of Agency of Industrial Science and Technology: *See—*
Ueno, Masakazu; and Ichimura, Takeshige, 4,594,261, Cl. 427-39.000.
Dischert, Robert A., to RCA Corporation. Recording of timing signals synchronous with a rotary recorder member. 4,594,616, Cl. 360-36.100.
Discovision Associates: *See—*
Livingston, Rodney S., 4,594,702, Cl. 369-45.000.
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Dobigny, Bernard; and Mazzone, Jean-Pierre, to Essilor International. Optical lenses having a scratch-resistant coating. 4,594,288, Cl. 428-339.000.
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Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Mezger, Hans, 4,593,525, Cl. 60-606.000.
Mezger, Hans, 4,593,655, Cl. 123-41.770.
Dr. Johannes Heidenhain GmbH: *See—*
Berner, Eckhard, 4,593,472, Cl. 33-125.00C.
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Schmitt, Walter, 4,594,538, Cl. 318-565.000.
Schmitt, Walter; and Ritz, Franz, 4,594,579, Cl. 340-347.0SY.
Doduco KG Dr. Eugen Durrwachter: *See—*
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Giani, Roberto; Parini, Ettore; and Tonon, Giancarlo, 4,594,190, Cl. 260-239.30R.
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Dong, Walter; and Petty, Walter L., to Shell Oil Company. Cyanohydrination of an aromatic aldehyde. 4,594,198, Cl. 558-351.000.
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Donoghue, William J., to Motorola, Inc. Circuit for equalizing bit lines in a ROM. 4,594,689, Cl. 365-182.000.
Doss, Saad K.; and Phipps, Peter B. P., to International Business Machines Corporation. High-rate electroless deposition process. 4,594,273, Cl. 427-443.100.
Dow Chemical Company, The: *See—*
Bertram, James L.; Walker, Louis L.; Berman, Jody R.; and Clarke, James A., 4,594,291, Cl. 428-414.000.
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Clark, Daniel O.; Damrow, Paul A.; and Tsang, Floris Y., 4,594,289, Cl. 428-368.000.
Greminger, George K., Jr.; and Dehnke, Mary K., 4,594,108, Cl. 106-170.000.
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Hoenig, Stephen M.; Flores, David P.; and O'Connell, Gregory S., 4,594,382, Cl. 524-400.000.
Inoue, Kimio, 4,594,459, Cl. 568-781.000.
Jones, Mary A., 4,594,391, Cl. 525-316.000.
Nelson, Donald L.; and Lamont, Mary J., 4,594,398, Cl. 525-531.000.
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Drimak, Edward G., to International Business Machines Corporation. Vector processing. 4,594,682, Cl. 364-900.000.
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Dubois, Patrick; and Renard, Jean-Claude, to Alsthom-Atlantique, S.A. Method of producing multifilament lengths of superconductor from ternary chalcogenides of molybdenum. 4,594,218, Cl. 419-4.000.
Dudzinski, Zdzislaw W., to Millmaster Onyx Group, Inc. Amine compositions produced by catalytic alkylation of methylamine by long chain alcohols. 4,594,455, Cl. 564-463.000.
Dumay, Michel: *See—*
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Dumire, Darrell L., to Tektronix, Inc. Precision lock tooling. 4,593,450, Cl. 29-559.000.
Dunagan, Lawrence G. Adjustable legs for desks and furniture. 4,593,874, Cl. 248-188.400.
Dupin, Jean-Louis, to L'Avebene. Derivatives of lignosulfonic acid. 4,594,168, Cl. 252-8.50C.
Duplessy, Christian J. Machine for sorting, packaging and dispensing of coins. 4,593,709, Cl. 133-3.00D.
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Anderson, Burton C.; England, David C.; and Resnick, Paul R., 4,594,399, Cl. 526-247.000.
Krespan, Carl G., 4,594,458, Cl. 568-615.000.
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Siuta, Vincent P., 4,594,181, Cl. 252-512.000.
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Dyckerhoff & Widmann AG: *See—*
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Dyer, John C.: *See—*
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Dyke, Denis G.; and Oshlag, David A., to American Sterilizer Company. Device for detecting the presence of noncondensable gas in steam sterilizers. 4,594,223, Cl. 422-56.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Fibranz, Joachim, 4,593,622, Cl. 102-530.000.
Dyson, James, to Prototypes, Ltd. Vacuum cleaning appliance. 4,593,429, Cl. 15-353.000.
Dziubakowski, Donald J.; and Smith, John W., to Babcock & Wilcox Company, The. Control system for a fluidized bed. 4,593,477, Cl. 34-10.000.
E. R. Squibb & Sons, Inc.: *See—*
Delaney, Norma G.; and Gordon, Eric M., 4,594,188, Cl. 530-332.000.
Thottathil, John K., 4,594,199, Cl. 260-502.40R.
Ealer, George E., to Union Carbide Corporation. Reduction elimination of bubble formation when extruding granular polyolefins. 4,594,213, Cl. 264-211.000.
Earman, Allen M.; and Higashi, James Y., to RCA Corporation. System for recording data on spiral track. 4,594,701, Cl. 369-43.000.
Eastman Kodak Company: *See—*
Frank, Lee F.; and Kaiser, Donald F., 4,594,614, Cl. 358-214.000.
Holzhauser, Ronald C., 4,593,995, Cl. 355-3.00R.
Jakubowicz, Raymond F.; and MacDonald, Stuart G., 4,593,837, Cl. 222-288.000.
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,594,445, Cl. 560-103.000.
Thomsen, Joelle R.; and Fagerburg, David R., 4,594,406, Cl. 528-271.000.
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Copeland, James L., 4,594,175, Cl. 252-99.000.
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Eder, Erich, to Krones AG Hermann Kronseder Maschinenfabrik. Labeling machine for containers. 4,594,123, Cl. 156-456.000.
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Edlin, George R.; and Robb, John D., to United States of America, Army. Multimegavolt high current switch. 4,594,532, Cl. 315-331.000.
Edwards, Robert B., II: *See—*
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Effenberger, Alfred: *See—*
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Ehrlich, Saul. Modular tube unit for fluidized bed boilers. 4,593,652, Cl. 122-4.00D.

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Eichen, Erwin; and Flasck, James, to Energy Conversion Devices, Inc. Multilayer coating including disordered, wear resistant boron carbon external coating. 4,594,294, Cl. 428-552.000.
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Eijadi, David A.; and Bennett, David J., to Bennett, Ringrose, Wolsfeld, Jarvis, Gardner, Inc. Solar illumination device. 4,593,976, Cl. 350-260.000.
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Eklof, Ake T., to Atlas Copco Aktiebolag. Hydraulically operated impact device. 4,593,768, Cl. 173-116.000.
Elba-Werk Maschinengesellschaft mbH & Co.: *See—*
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Electric Power Development Co., Ltd.: *See—*
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Painter, Robert A., 4,594,644, Cl. 361-417.000.
Eli Lilly and Company: *See—*
Brier, Gordon L., 4,594,247, Cl. 424-114.000.
Hynes, Martin D., 4,594,358, Cl. 514-651.000.
Mynderse, Jon S.; and Fukuda, David S., 4,594,431, Cl. 546-138.000.
Ose, Earl E.; and Turner, Jan R., 4,594,337, Cl. 514-30.000.
Yang, Kuo S., 4,594,417, Cl. 544-28.000.
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Elliott, Charles T.; Humphreys, Richard G.; and Watton, Rex, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Thermal imager. 4,594,507, Cl. 250-331.000.
Elliott, Michael; Janes, Norman F.; Elliott, Richard L.; Khambay, Bhupinder P. S.; and Pulman, David A., to National Research Development Corp. Pesticides. 4,594,355, Cl. 514-521.000.
Elliott, Richard L.: *See—*
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Elsbett, Ludwig; and Elsbett, Gunter. Piston drive for use in diesel engines or the like. 4,593,660, Cl. 123-193.00P.
Elsner, Emil; and Brehmer, Horst, to Von Roll AG. Process for producing reinforcing steel in the form of rods or rod wire. 4,594,113, Cl. 148-12.00B.
Elworthy, John H.: *See—*
Rapsey, Colin; and Elworthy, John H., 4,594,499, Cl. 219-221.000.
Emab Electrolux Motor Aktiebolag: *See—*
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Endo, Masami: *See—*
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Endo, Michitada: *See—*
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Endo, Takayoshi; Sugiyama, Toshimasa; Murofushi, Satoru; and Yagi, Sakai, to Yazaki Corporation. Wire-harness for automobiles. 4,593,963, Cl. 339-97.00R.
Endo, Yoshihiro: *See—*
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Mikawa, Isao; Endoh, Masahiro; Kaji, Masayuki; Kishida, Yoshitaka; and Yamamoto, Nobuhiro, 4,593,632, Cl. 111-3.000.
Endress u. Hauser GmbH u. Co.: *See—*
Pfeiffer, Helmut; Dreyer, Volker; and Pfandler, Martin, 4,594,584, Cl. 340-620.000.
Enea-Comitato Nazionale per la Ricerca e lo Sviluppo dell'Energia Nucleare e dell'Energie Alternative: *See—*
Penco, Eugenio; and Salvetti, Gianemilio, 4,594,721, Cl. 372-88.000.
Energy Conversion Devices, Inc.: *See—*
Eichen, Erwin; and Flasck, James, 4,594,294, Cl. 428-552.000.
Enetronics, Inc.: *See—*
Thiele, Karl O.; and Toth, Steven L., 4,593,461, Cl. 29-623.100.
Engebretson, Harold J.: *See—*
Brown, David C.; Engebretson, Harold J.; and Watson, Fred L., 4,593,559, Cl. 73-151.000.
Engelke, Fritz: *See—*
Hoft, Peter; Peter, Wolfgang; Hacke, Heinz; Luhr, Jurgen; Bergsteiner, Johann; Drobe, Wolfgang; Engelke, Fritz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,593,834, Cl. 220-273.000.
England, David C.: *See—*
Anderson, Burton C.; England, David C.; and Resnick, Paul R., 4,594,399, Cl. 526-247.000.
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Murase, Masao; Inoue, Kichiro; and Shirahase, Ichiro, to Nippon Shinyaku Co. Ltd. Methylflavone-8-carboxylates. 4,594,345, Cl. 514-234.000.
Entemann, Robert: *See—*
Bonitz, Jorg; Entemann, Robert; Miller, Bernhard; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, 4,593,553, Cl. 73-35.000.
Enz, Ulrich E.: *See—*
Stoppels, Doeko; Boonen, Peter G. T.; Enz, Ulrich E.; and van Hoof, Leonardus A. H., 4,594,628, Cl. 360-125.000.
Ericsson, Sven O., to S O Eriksson Maskin AB. Method and installation for processing trees in a terminal landing. 4,593,732, Cl. 144-2.00Z.
Eriksson, Andrew J.; and Kuhn, Patrick C., to South African Inventions Development Corporation. Lightning warning system. 4,594,543, Cl. 324-72.000.
Eriksson, Sune, to SKF Steel Engineering AB. Method of manufacturing calcium carbide from powdered lime and/or limestone. 4,594,236, Cl. 423-441.000.
Esposito, Augustine G.: *See—*
Klievoneit, Harold R.; and Esposito, Augustine G., 4,593,496, Cl. 51-118.000.
Esselman, Walter H.: *See—*
Rabinowitz, Mario; and Esselman, Walter H., 4,594,630, Cl. 361-13.000.
Esser, Franz: *See—*
Koppe, Herbert; Abele, Wolfgang, deceased; Esser, Franz; Gaida, Wolfram; and Hoefke, Wolfgang, 4,594,344, Cl. 514-222.000.
Essilor International: *See—*
Dobigny, Bernard; and Mazzone, Jean-Pierre, 4,594,288, Cl. 428-339.000.
Ethyl Corporation: *See—*
Ranken, Paul F.; and McKinnie, Bonnie G., 4,594,453, Cl. 564-440.000.
Zaweski, Edward F.; and Niebylski, Leonard M., 4,594,077, Cl. 44-57.000.
Eue, Wolfgang; and Strelow, Horst, to Siemens Aktiengesellschaft. Data processing system safety output circuits. 4,594,681, Cl. 364-900.000.
European Electric Motors Design and Engineering Anstalt: *See—*
Gutris, Giorgio, 4,594,009, Cl. 384-203.000.
Evans, Ben E.: *See—*
Bock, Mark G.; Evans, Ben E.; Freidinger, Roger M.; and Pitzenberger, Steven M., 4,594,191, Cl. 260-239.30P.
Evans, Mark: *See—*
Krutz, Gary W.; and Evans, Mark, 4,593,555, Cl. 73-116.000.
Evensen, Knut: *See—*
Aune, Jan A.; and Evensen, Knut, 4,593,886, Cl. 266-44.000.
Everpure, Inc.: *See—*
Beauman, William H.; Jarog, Dean J.; and Micklin, Steven H., 4,594,361, Cl. 521-28.000.
Evertz, Egon; and Seybold, Rolf. Hammer-tool, particularly for driving bolts and like fasteners. 4,593,846, Cl. 227-130.000.
Ex-Cell-O Corporation: *See—*
Smith, Robert F.; and Bemis, Claude, 4,593,880, Cl. 249-91.000.
Exxon Research and Engineering Co.: *See—*
Achia, Biddanda U.; DeKraker, Abraham R.; and Rossi, Albert, 4,594,142, Cl. 208-33.000.
Fiato, Rocco A.; and Kugler, Edwin L., 4,594,331, Cl. 502-34.000.
Roarty, John C., 4,594,145, Cl. 208-79.000.
Fabric and Structure Technology, Inc.: *See—*
Stafford, Robert; and Cook, Gregory, 4,593,710, Cl. 135-102.000.
FACOM: *See—*
Brihier, Gerard C. C., 4,593,564, Cl. 73-473.000.
Fagerburg, David R.: *See—*
Thomsen, Joelle R.; and Fagerburg, David R., 4,594,406, Cl. 528-271.000.
Fairchild Camera & Instrument Corp.: *See—*
Harrah, Shane; and Phy, William, 4,594,493, Cl. 219-56.220.
Necoechea, R. Warren, 4,594,544, Cl. 324-73.0AT.
Faix, John J., to United States of America, Navy. Rocket weapon system and method therefor. 4,593,602, Cl. 89-1.813.
Falcimaigne, Jean: *See—*
Schawann, Jean C.; Caumont, Jean P.; and Falcimaigne, Jean, 4,593,937, Cl. 285-18.000.
Falk, Robert A.; and Phillis, Gary L., to Ball Corporation. Method and apparatus for optically measuring distance and velocity. 4,594,000, Cl. 356-5.000.
Falk, Sidney. Digital electronic lock system. 4,594,637, Cl. 361-172.000.
Fanale, Donald J.: *See—*
Lane, Richard L.; and Fanale, Donald J., 4,594,127, Cl. 156-617.00R.
FAP Praticus S.p.A.: *See—*
Maleci, Guglielmo; and Latini, Tullio, 4,594,019, Cl. 403-246.000.
Farquhar, George N., to Emab Electrolux Motor Aktiebolag. Brake operating device. 4,593,796, Cl. 188-77.00R.

Farrow, Cecil W.; and Salz, Jack, to AT&T Information Systems Inc. Bell Telephone Laboratories, Inc. Fast start-up of adaptive echo canceler or echo measurement device. 4,594,479, Cl. 179-170.200.

Fauss, Rudolf: *See—*
Findeisen, Kurt; Konig, Klaus; Fauss, Rudolf; and Heitkamper, Peter, 4,594,441, Cl. 560-25.000.

Favorite Manufacturing, Inc.: *See—*
Martin, Eugene G.; and Risser, Dale M., 4,593,435, Cl. 17-52.000.

Felder, Louis: *See—*
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,594,400, Cl. 526-256.000.

Ferag AG: *See—*
Honegger, Werner, 4,593,865, Cl. 242-67.10R.

Ferrari Aggradi, Gian P.; and Bonfiglioli, Giampaolo, to Nuovo Pignone S.p.A.; and Snam S.p.A. Method for tightly jointing a sleeve to a submarine pipe laid at great depth. 4,593,448, Cl. 29-523.000.

Ferrari Aggradi, Gian P.; and Bonfiglioli, Giampaolo, to Nuovo Pignone S.p.A.; and Snam S.p.A. Seal system, particularly suitable for the ball joint of installations laid at great depths. 4,593,917, Cl. 277-30.000.

Ferrero, Pietro, to Ferrero S.p.A. Container for food products, particularly sweet products, usable as a money box. 4,593,817, Cl. 206-457.000.

Ferrero S.p.A.: *See—*
Ferrero, Pietro, 4,593,817, Cl. 206-457.000.

Fershko, Jane S.; and Lackey, Robert W., to Mead Corporation, The. Gravity feed display device. 4,593,823, Cl. 211-49.100.

Feutrel, Claude, to Commissariat a l'Energie Atomique. Spacing grid for a nuclear reactor fuel element. 4,594,216, Cl. 376-442.000.

Fiato, Rocco A.; and Kugler, Edwin L., to Exxon Research and Engineering Co. Improving activity of iron carbide and ilmenite on titania Fischer-Tropsch catalyst. 4,594,331, Cl. 502-34.000.

Fiber Controls Corporation: *See—*
Burgess, W. D.; Lytton, Glenn E.; and Nash, Ronald S., 4,593,436, Cl. 19-105.000.

Fibranz, Joachim, to Dynamit Nobel Aktiengesellschaft. Industrial cartridge with separated deflagrating components. 4,593,622, Cl. 102-530.000.

Fields, Jerry L.: *See—*
Pann, Keh; and Fields, Jerry L., 4,594,693, Cl. 367-43.000.

Figgie, Harry E., III; and Figgie, Matthew P., to Figgie International Inc. Knee pad. 4,593,416, Cl. 2-24.000.

Figgie International Inc.: *See—*
Figgie, Harry E., III; and Figgie, Matthew P., 4,593,416, Cl. 2-24.000.

Figgie, Matthew P.: *See—*
Figgie, Harry E., III; and Figgie, Matthew P., 4,593,416, Cl. 2-24.000.

Finck, Lothar: *See—*
Lewin, Hans G.; and Finck, Lothar, 4,593,744, Cl. 164-448.000.

Findeisen, Kurt; Konig, Klaus; Fauss, Rudolf; and Heitkamper, Peter, to Bayer Aktiengesellschaft. Process for the preparation of urethanes. 4,594,441, Cl. 560-25.000.

Fink, James K.; and Habel, David H., to Burlington Northern Railroad Company. Carbon dioxide refrigeration system. 4,593,536, Cl. 62-239.000.

Finnemore, Harlan E., to Air Preheater Company, Inc., The. Radial seal assembly for rotary regenerative heat exchanger. 4,593,750, Cl. 165-9.000.

Firestone Tire & Rubber Company, The: *See—*
Davis, James A., 4,594,381, Cl. 524-396.000.

Fischell, Robert E., to Johns Hopkins University, The. Single valve diaphragm pump with decreased sensitivity to ambient conditions. 4,594,058, Cl. 417-413.000.

Fischer, William C.; Verzella, David J.; and Wright, Stuart C., to United Technologies Corporation. Dual-actuator monitor. 4,594,714, Cl. 371-62.000.

Fischer, William F.; LeMasters, Donald P.; and Harbison, William C., to Swedlow, Inc. Impact resistant laminate. 4,594,290, Cl. 428-212.000.

Fish, Franklin H., to United States of America, Navy. Solid state, high-low resistance monitor. 4,594,542, Cl. 324-62.000.

Flanders, Andrew E., to Weston, C. Harold, Jr. Loudspeaker enclosure. 4,593,784, Cl. 181-144.000.

Flanders, James R.: *See—*
Clarkson, Andrew P.; Flanders, James R.; and Price, Frank C., 4,593,423, Cl. 12-145.000.

Flasck, James: *See—*
Eichen, Erwin; and Flasck, James, 4,594,294, Cl. 428-552.000.

FLONIC: *See—*
Carte, Michel; Benadassi, Michel; and Dumay, Michel, 4,593,562, Cl. 73-266.000.

Flores, David P.: *See—*
Hoenig, Stephen M.; Flores, David P.; and O'Connell, Gregory S., 4,594,382, Cl. 524-400.000.

Flowers, Edward P., to Medasonics, Inc. Plethysmograph cuff bladder. 4,593,692, Cl. 128-327.000.

FMC Corporation: *See—*
Brown, Richard A.; Norris, Robert D.; and Richards, Joseph C., 4,594,170, Cl. 252-8.55R.
Chandra, Rangasami S.; Quen, Stephen G.; Eineichner, Donald E.; and Lastra, Jorge E., 4,594,665, Cl. 364-422.000.
Goodell, Bradley D., 4,593,605, Cl. 91-528.000.

Fogg, Sidney G.; and Robertson, Frank C., to British Petroleum Company p.l.c., The. Copolymer, a film forming composition and a method of coating a surface with the composition. 4,594,383, Cl. 524-510.000.

Folger Adam Company: *See—*
Stefanek, Ronald T., 4,593,543, Cl. 70-134.000.

Folgero, Kare; and Kollberg, Sten, to ASEA AB. Method for providing pinch control of a tundish channel-type inductor. 4,594,723, Cl. 373-142.000.

Folk, Lee E.; and Asher, Reginald K., to Motorola, Inc. Laser marking method and ablative coating for use therein. 4,594,263, Cl. 427-53.100.

Font, Linda T., to Commonwealth of Puerto Rico. Board game. 4,593,910, Cl. 273-273.000.

Forchheim, Hans: *See—*
Zschocke, Christian; and Forchheim, Hans, 4,593,884, Cl. 254-264.000.

Forman, Todd M.: *See—*
Zemelman, Valery B.; Burgess, Gary L.; Vitti, Rudolf A.; Forman, Todd M.; Batchelor, Anthony M.; and Leblanc, Yvon N., 4,594,256, Cl. 426-594.000.

Forney, Edgar W., Jr.; and Hogendobler, Richard S., to AMP Incorporated. Coaxial electrical connector for multiple outer conductor coaxial cable. 4,593,964, Cl. 339-177.00R.

Forsyth, Robert W., to Vehicle Systems Development Corporation. Vehicle-mountable fire fighting apparatus. 4,593,855, Cl. 239-74.000.

Fory, Werner: *See—*
Schurter, Rolf; Fory, Werner; and Meyer, Willy, 4,594,097, Cl. 71-93.000.

Fox, Bernard L.: *See—*
Salyer, Ival O.; and Fox, Bernard L., 4,594,368, Cl. 523-179.000.

Fox, Jack J.: *See—*
Lopez, Carlos; Watanabe, Kyoichi A.; Reichman, Uri; and Fox, Jack J., 4,594,339, Cl. 514-42.000.

Fox, Wayne D.; and Gheer, Barry J., to Xerox Corporation. Residual toner removal and collection apparatus. 4,593,997, Cl. 355-15.000.

Fradin, Maurice. Method for mincing and prepackaging minced meat under controlled atmosphere and temperature. 4,594,253, Cl. 426-393.000.

Franceschini, Jacqueline F.: *See—*
Thominet, Michel L.; and Franceschini, Jacqueline F., 4,594,428, Cl. 548-570.000.

Frangesh, Thomas P., to Xerox Corporation. Air filtration system for rotating disk drives having recirculating air flows. 4,594,626, Cl. 360-97.000.

Frank-Fahle, Gottfried: *See—*
Schaefer, Karl; Frank-Fahle, Gottfried; and Gasenzer, Norbert, 4,593,862, Cl. 241-88.000.

Frank, Joachim. Apparatus for fixing a coordinate point within a flat data representation. 4,594,683, Cl. 364-900.000.

Frank, Lee F.; and Kaiser, Donald F., to Eastman Kodak Company. Film video player with electronic strobe light. 4,594,614, Cl. 358-214.000.

Freeman, Michael J. Broadcast interactive telephone system. 4,594,476, Cl. 179-6.080.

Freeman, Raymond C.: *See—*
Gumb, Beverley W.; Freeman, Raymond C.; and Busche, Alan C., 4,594,478, Cl. 179-103.000.

Freidinger, Roger M.: *See—*
Bock, Mark G.; Evans, Ben E.; Freidinger, Roger M.; and Pitzenberger, Steven M., 4,594,191, Cl. 260-239.30P.

French, James C.: *See—*
Wilton, John H.; Hokanson, Gerard C.; and French, James C., 4,594,248, Cl. 424-117.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Bebber, Hans J.; Rossner, Heinrich-Otto; and Tomalla, Gebhard, 4,594,496, Cl. 219-121.0PP.

Frisch, David C.; and Weber, Wilhelm, to Kollmorgen Technologies Corporation. Process for the photoselective metallization on nonconductive plastic base materials. 4,594,311, Cl. 430-315.000.

Frisch, Gerhard: *See—*
Albrecht, Konrad; and Frisch, Gerhard, 4,594,096, Cl. 71-93.000.

Fujawa, Charles S.; and Masteller, Sara B., to Allied Corporation. Turbocharger control system. 4,594,668, Cl. 364-431.020.

Fuji Kiko Company, Limited: *See—*
Kinoshita, Satoshi, 4,593,577, Cl. 74-493.000.

Fuji Photo Film Co., Ltd.: *See—*
Fujita, Shinsaku; Koyama, Koichi; and Inagaki, Yoshio, 4,594,426, Cl. 548-217.000.
Furutachi, Nobuo; and Yoshida, Yoshinobu, 4,594,313, Cl. 430-381.000.
Hagiwara, Hideo; and Matsumoto, Hiroshi, 4,593,814, Cl. 206-387.000.
Horie, Seiji; Nagata, Masayoshi; Nakano, Junji; and Sato, Hideo, 4,594,303, Cl. 430-59.000.
Kubono, Shunji; and Anayama, Ushio, 4,593,996, Cl. 355-5.000.
Morimoto, Kiyoshi; Furuya, Keizo; and Toriuchi, Masaharu, 4,594,316, Cl. 430-559.000.
Nakamura, Taku; Hibino, Akira; Shibata, Takeshi; and Nakamura, Koichi, 4,594,308, Cl. 430-213.000.
Sasaki, Noboru; Aida, Shunichi; and Ikeda, Tadashi, 4,594,317, Cl. 430-574.000.
Watarai, Shu; and Horie, Seiji, 4,594,304, Cl. 430-59.000.
Yamasaki, Teiichi; and Takahashi, Yutaka, 4,593,867, Cl. 242-181.000.

Fuji Photo Filmco., Ltd.: *See—*
Takahashi, Tsunehiko; and Yoneya, Sigenori, 4,594,596, Cl. 346-76.00L.

Fuji Seiko Limited: *See*—
Haga, Katutoshi; Sasamori, Takehusa; Kurita, Teizi; and Katumata, Noriaki, 4,594,037, Cl. 409-144.000.

Fujii, Katsuyoshi, to Matsushita Electric Industrial Company, Limited. Circuit arrangement for A/D and/or D/A conversion with nonlinear D/A conversion. 4,594,576, Cl. 340-347.0AD.

Fujimoto, Masakazu, to Ebara Corporation. Absorption cooling and heating apparatus and method. 4,593,531, Cl. 62-101.000.

Fujimura, Takehiko: *See*—
Maruhashi, Shigeaki; Hoshino, Kazuo; Uematsu, Yoshihiro; Miyakusu, Katsuhisa; and Fujimura, Takehiko, 4,594,114, Cl. 148-12.0EA.

Fujioka, Akira: *See*—
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,594,379, Cl. 524-114.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,594,446, Cl. 560-168.000.

Fujishima, Tetsuro, to Yamasa Shoyu Kabushiki Kaisha. Process for producing 3-deoxyguanosine. 4,594,320, Cl. 435-89.000.

Fujishima, Tetsuro; and Sakata, Shinji, to Yamasa Shoyu Kabushiki Kaisha. Process for producing 3-deoxyguanosine. 4,594,321, Cl. 435-89.000.

Fujita, Eiji: *See*—
Tomisawa, Yoshiaki; Kinoda, Seiji; Fujita, Eiji; Murata, Masanori; Takeuchi, Toshio; and Ogawa, Ken, 4,593,986, Cl. 354-324.000.

Fujita, Hisashi: *See*—
Yagi, Hiroshi; Fujita, Hisashi; and Harigane, Kotaro, 4,593,462, Cl. 29-740.000.

Fujita, Shinsaku; Koyama, Koichi; and Inagaki, Yoshio, to Fuji Photo Film Co., Ltd. Benzoxazole derivative intermediates for synthesis of dye releasing redox compounds. 4,594,426, Cl. 548-217.000.

Fujitsu Limited: *See*—
Matsunoshita, Fumirou; and Sato, Kiyosumi, 4,594,710, Cl. 371-16.000.

Fujiwara, Katsuyoshi; and Uchiyama, Hiroshi, to Sharp Kabushiki Kaisha. Charge removing device for an electrophotographic copying machine. 4,593,989, Cl. 355-3.00R.

Fujiwara, Kenzo; Takeuchi, Norio; Nakatsuka, Yoji; Horita, Tsuyoshi; Nakanishi, Yuji; and Murasato, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Armature winding of a split stator. 4,594,522, Cl. 310-42.000.

Fujiwara, Kenzou: *See*—
Horita, Tsuyoshi; Nakatsuka, Yoji; Fujiwara, Kenzou; Takeuchi, Norio; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,523, Cl. 310-42.000.

Fujiwara, Kunihiko: *See*—
Shimizu, Shunji; Watakabe, Yuichi; Fujiwara, Kunihiko; and Yabumoto, Toshiaki, 4,594,298, Cl. 429-72.000.

Fukuda, David S.: *See*—
Mynderse, Jon S.; and Fukuda, David S., 4,594,431, Cl. 546-138.000.

Fukuhara, Hiroshige, to Nissan Motor Company, Limited. Loran signal receiver. 4,594,594, Cl. 343-389.000.

Fukushima, Fumio; Terada, Jiro; and Nitta, Tsuneharu, to Matsushita Electric Industrial Co., Ltd. Humidity sensitive device. 4,594,569, Cl. 338-35.000.

Fukushima, Hirotaka: *See*—
Takeuchi, Hiroshi; Fukushima, Hirotaka; and Majima, Hidekazu, 4,593,801, Cl. 192-70.150.

Fumagalli, Carlo: *See*—
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, 4,594,433, Cl. 549-256.000.

Funada, Fumiaki: *See*—
Takamatsu, Toshiaki; Funada, Fumiaki; Matsuura, Masataka; and Uchida, Tatuo, 4,593,977, Cl. 350-339.00F.

Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, to Nippon Sheet Glass Co., Ltd.; and Sumitomo Chemical Company, Limited. Non-fogging coating composition and a shaped article coated therewith. 4,594,379, Cl. 524-114.000.

Funaki, Motokatsu. Facing material for building and method for connecting same. 4,593,512, Cl. 52-519.000.

Furuhashi, Toshio: *See*—
Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Osamu; and Hasegawa, Taiji, 4,593,663, Cl. 123-440.000.

Furukawa Electric Co., Ltd., The: *See*—
Shimizu, Shunji; Watakabe, Yuichi; Fujiwara, Kunihiko; and Yabumoto, Toshiaki, 4,594,298, Cl. 429-72.000.

Furutachi, Nobuo; and Yoshida, Yoshinobu, to Fuji Photo Film Co., Ltd. Color image forming process comprising blocked magenta dye forming coupler. 4,594,313, Cl. 430-381.000.

Furuya, Keizo: *See*—
Morimoto, Kiyoshi; Furuya, Keizo; and Toriuchi, Masaharu, 4,594,316, Cl. 430-559.000.

Futatsuya, Fumio: *See*—
Yamada, Osamu; Yanagi, Mikio; Futatsuya, Fumio; and Kobayashi, Kenji, 4,594,099, Cl. 71-96.000.

Gaida, Wolfram: *See*—
Koppe, Herbert; Abele, Wolfgang, deceased; Esser, Franz; Gaida, Wolfram; and Hoefke, Wolfgang, 4,594,344, Cl. 514-222.000.

Gallagher, Thomas F.: *See*—
Cooper, David E.; and Gallagher, Thomas F., 4,594,511, Cl. 250-339.000.

Galland Henning Nopak, Inc.: *See*—
Grassl, Roman; Craig, Thomas A.; and Weil, Eric P., 4,594,487, Cl. 200-82.00E.

Galli, Graziano; and Pina, Felice, to Manuli Autoadesivi S.p.A. Adhesive tapes having a film backing of polypropylene or other olefinic polymer or copolymer and related manufacturing process. 4,594,277, Cl. 428-40.000.

Gallios, George C., to Venus Scientific Inc. Wide frequency band coupling network for an active ripple and noise filter. 4,594,648, Cl. 363-46.000.

Galtier, Lucien, to Automobiles Citroen; and Automobiles Citroen. Motor vehicle steering system assisted by an electric motor. 4,593,781, Cl. 180-79.100.

Gannon, Mark A.; and Yester, Francis R., Jr., to Motorola, Inc. Method to achieve a desired bandwidth at a given frequency in a dielectric resonator filter. 4,593,460, Cl. 29-602.00R.

Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., to U.S. Philips Corporation. Circuit arrangement for operating high-pressure gas discharge lamps. 4,594,531, Cl. 315-307.000.

Garconnat, Michel; and Morgand, Philippe, to Thomson-CSF. Methods and device for attenuating spurious noise. 4,594,695, Cl. 367-135.000.

Gardner, Harry E., to Union Carbide Corporation. Process for the production of vanadium carbide. 4,594,235, Cl. 423-440.000.

Garner, Robert H.: *See*—
Cook, Jerry A.; Garner, Robert H.; Turner, Ralph E., Jr.; and Bilimoria, Bomi M., 4,593,860, Cl. 241-23.000.

Garrett Corporation, The: *See*—
Bailey, David A., 4,593,528, Cl. 60-673.000.

Garrigues, Jean-Claude: *See*—
Laulhe, Rene ; and Garrigues, Jean-Claude, 4,593,916, Cl. 277-12.000.

Garthaffner, Martin T., to Philip Morris Inc. Slitter knife advance unit and method of use. 4,593,705, Cl. 131-84.400.

Garver, Lee C.: *See*—
Grakauskas, Vytautas; Garver, Lee C.; and Baum, Kurt, 4,594,430, Cl. 549-9.000.

Gasenzer, Norbert: *See*—
Schaefer, Karl; Frank-Fahle, Gottfried; and Gasenzer, Norbert, 4,593,862, Cl. 241-88.000.

Gasser, Daniel: *See*—
Sidler, Thomas; and Gasser, Daniel, 4,594,514, Cl. 250-556.000.

Gast, Jurgen: *See*—
Simon, Arno; and Gast, Jurgen, 4,594,509, Cl. 250-338.000.

Gaston, John R., to Dresser Industries, Inc. Apparatus and method for detecting surge in a turbo compressor. 4,594,050, Cl. 415-1.000.

Gaston, John R., to Dresser Industries, Inc. System, apparatus, and method for detecting and controlling surge in a turbo compressor. 4,594,051, Cl. 415-48.000.

Gauger, Gary L. Portable drum set. 4,593,596, Cl. 84-421.000.

Gavrilovic, Alexander. Fluid parameter measurement system. 4,593,561, Cl. 73-170.00A.

Geissel Francis A.; Alexander, William W.; and Rys-Sikora, John, to Bata Limited. Antistatic composition and articles made therefrom. 4,594,367, Cl. 523-167.000.

Geissler, Alfred. Sealing arrangement. 4,593,918, Cl. 277-96.100.

General Electric Company: *See*—
Adler, Michael S., 4,593,458, Cl. 29-576.00W.
Germer, Warren R., 4,594,545, Cl. 324-103.00R.
Haitko, Deborah A., 4,594,405, Cl. 528-215.000.
Jaswa, Vijay C.; and Thomas, Charles E., 4,594,651, Cl. 364-131.000.
McCready, Russell J., 4,594,377, Cl. 524-101.000.
Stokes, Vijay K., 4,594,525, Cl. 310-156.000.
Wilham, Donald W.; and Rowe, Richard A., 4,594,481, Cl. 200-5.00A.

General Foods Corporation: *See*—
Leblanc, Yvon N.; Zemelman, Valery B.; and Burgess, Gary L., 4,594,257, Cl. 426-594.000.
Vitti, Rudolf A.; Burgess, Gary L.; and Zemelman, Valery B., 4,594,258, Cl. 426-594.000.
Zemelman, Valery B.; Burgess, Gary L.; Vitti, Rudolf A.; Forman, Todd M.; Batchelor, Anthony M.; and Leblanc, Yvon N., 4,594,256, Cl. 426-594.000.

General Signal Corporation: *See*—
Lane, Richard L.; and Fanale, Donald J., 4,594,127, Cl. 156-617.00R.
Owens, Jeffrey, 4,594,685, Cl. 364-900.000.
Walsh, Thomas J., 4,594,578, Cl. 340-347.0AD.

Gengenbach, Bruno; Meyer, Carl-Ludwig; Michal, Roland; and Remenyi, Ferenc, to Doduco KG Dr. Eugen Durrwachter. Electrical switching element. 4,594,489, Cl. 200-151.000.

Genovese, Frank C., to Xerox Corporation. Vacuum fluorescent lamp having a flat geometry. 4,594,527, Cl. 313-493.000.

Genrad, Inc.: *See*—
Congdon, James S., 4,594,558, Cl. 330-9.000.

Geo Max Drill Corp.: *See*—
Lingafelter, Jerry, 4,593,774, Cl. 175-107.000.

Geophysical Company of Norway A.S.: *See*—
Lien, Eldar K.; and Caspersen, Sverre, 4,594,696, Cl. 367-144.000.

George, Steven L.; and Hefner, James L., to International Business Machines Corporation. High speed hardware multiplier for fixed floating point operands. 4,594,679, Cl. 364-754.000.

Gerads, Lyle J.: *See*—
Ness, Joseph M.; and Gerads, Lyle J., 4,593,800, Cl. 192-56.00R.

Gerhard, Helmut, to Westerwalder Eisenwerk Gerhard GmbH. Freight container. 4,593,832, Cl. 220-1.500.

Gerlach, John N.: *See—*
Satchell, Donald P., Jr.; and Gerlach, John N., 4,594,132, Cl. 204-105.00R.

Germer, Warren R., to General Electric Company. Operation of electronic demand register following a power outage. 4,594,545, Cl. 324-103.00R.

Geze GmbH: *See—*
Scheck, Georg; and Bogner, Martin, 4,593,928, Cl. 280-625.000.

Ghaderi, Sahba, to Nicolet Instrument Corporation. Gas chromatograph/mass spectrometer interface. 4,594,506, Cl. 250-288.000.

Gheer, Barry J.: *See—*
Fox, Wayne D.; and Gheer, Barry J., 4,593,997, Cl. 355-15.000.

Gherardi, Gianluigi, to Sasib S.p.A. Web cutting device. 4,593,589, Cl. 83-168.000.

Giacobbe, Thomas J.; and Tsien, Grace, to Rhone:Pulenc, Inc. Process for recovering and purifying herbicidal phenoxybenzoic acid derivatives. 4,594,440, Cl. 560-021.000.

Giallorenzi, Thomas G., to United States of America, Navy. Potting techniques for fiber optical couplers. 4,593,968, Cl. 350-96.150.

Giani, Roberto; Parini, Ettore; and Tonon, Giancarlo, to Dompe' Farmaceutici S.p.A. Quaternary salts of dibenzo[1,4]diazepinones, pyrido-[1,4]benzodiazepinones, pyrido[1,5]benzodiazepinones with antiulcer, antisecretory, spasmolytic and antimusarinic activities. 4,594,190, Cl. 260-239.30R.

Giasuddin, Abu S. M.: *See—*
Lehner, Thomas; and Giasuddin, Abu S. M., 4,594,244, Cl. 424-87.000.

Gibbons, John E. C.: *See—*
Whitehead, Thomas P.; Thorpe, Gary H. G. H.; Kricka, Larry J.; Gibbons, John E. C.; and Bunce, Roger A., 4,593,728, Cl. 141-98.000.

Gibson, Lloyd H. Connector for optical fibers. 4,593,972, Cl. 350-96.210.

Gillberg, James E.: *See—*
Cohen, William R.; and Gillberg, James E., 4,594,517, Cl. 307-296.00R.

Gillery, F. Howard; and Criss, Russell C., to PPG Industries, Inc. Stainless steel overcoat for sputtered films. 4,594,137, Cl. 204-192.0SP.

Gillman, Hyman D.: *See—*
Kesling, Haven S., Jr.; and Gillman, Hyman D., 4,594,185, Cl. 252-551.000.

Gilson, Robert L. Adjustable pattern. 4,593,888, Cl. 266-70.000.

Ginter, Sally P.: *See—*
Pawloski, Chester E.; and Ginter, Sally P., 4,594,364, Cl. 521-85.000.

Giovarruscio, Gabriele: *See—*
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,352, Cl. 514-332.000.
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,451, Cl. 564-44.000.

Girvan, John W. Borate algaecide and fungicide. 4,594,091, Cl. 71-67.000.

Gitlitz, Melvin H.: *See—*
Russell, David B.; Gitlitz, Melvin H.; Leiner, Howard H.; Khuddus, Mo A.; and Berger, Abe, 4,594,365, Cl. 523-122.000.

Glamkowski, Edward J.; and Jones, Michael C., deceased (by Jones, Herbert, administrator), to Hoechst-Roussel Pharmaceuticals, Inc. Intermediates for 2'-substituted-spiro[benzofuran-2(3H),1'-cycloalkanes]. 4,594,435, Cl. 549-345.000.

Glaxo Group Limited: *See—*
Padfield, John M.; and Groom, Cheryl V., 4,594,359, Cl. 514-647.000.

Glorioso, Paul A., to TRW Inc. Stud welding apparatus with two-wire control. 4,594,495, Cl. 219-98.000.

Glory Kogyo Kabushiki Kaisha: *See—*
Hashimoto, Koichi, 4,594,664, Cl. 364-405.000.

Glosecki, David M.: *See—*
Snyder, David A.; and Glosecki, David M., 4,593,445, Cl. 29-157.10R.

GLYCO-Antriebstechnik GmbH: *See—*
Stich, Bodo; Hassler, Ernst; Adamowicz, Slawomir; and Cyphelly, Ivan J., 4,593,715, Cl. 137-503.000.

Goel, Anil B.; Tufts, Timothy A.; and Blackburn, Peggy A., to Ashland Oil, Inc. Bicyclic amide acetal/polyisocyanate/vinyl monomer derived polymers. 4,594,397, Cl. 525-528.000.

Goeller, Loretta D.; and Skovdal, Jorgen, to Clairol Incorporated. Heated bristle curling brush. 4,593,708, Cl. 132-9.000.

Goldstein, Arthur L., to Ionics Incorporated. Process and apparatus for electrically desorbing components selectively sorbed on granules. 4,594,135, Cl. 204-180.100.

Gonda, Michihiro: *See—*
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Gonda, Michihiro; Kanasugi, Mikiko; and Obara, Toshio, 4,594,601, Cl. 346-221.000.

Goodell, Bradley D., to FMC Corporation. Fluid power transfer device. 4,593,605, Cl. 91-528.000.

Goodman, Jack E.; and Schmadel, Donald C., to Chevron Research Company. Ruggedized grated optical fiber. 4,593,969, Cl. 350-96.190.

Goodyear Tire & Rubber Company, The: *See—*
Lal, Joginder; and Sandstrom, Paul H., 4,594,389, Cl. 525-187.000.

Gordon, Eric M.: *See—*
Delaney, Norma G.; and Gordon, Eric M., 4,594,188, Cl. 530-332.000.

Gossard, Gordon G. Strafing pit conditioning apparatus with magnetic sweeper. 4,593,766, Cl. 171-63.000.

Goto, Hideo, to Yamato Scientific Co., Ltd. Reverse osmosis sealing means. 4,594,161, Cl. 210-433.200.

Goto, Hideto; and Amano, Haruo, to NEC Corporation. Semiconductor device having multilayer wiring structure. 4,594,606, Cl. 357-68.000.

Gott, Mary L.; and Broadley, Robert E. Insect swatter. 4,593,489, Cl. 43-137.000.

Gourdon, Claude: *See—*
Niquel, Maurice; Gourdon, Claude; and Rouxel, Jean, 4,594,728, Cl. 375-116.000.

Gourlandt, Jean-Pierre: *See—*
Bissardon, Andre ; Gourlandt, Jean-Pierre; Chastan, Gilles; and Lusseau, Marcel, 4,594,154, Cl. 210-105.000.

Gozzo, Franco: *See—*
Colle, Roberto; Gozzo, Franco; and Mirenna, Luigi, 4,594,353, Cl. 514-383.000.

Grabowski, Robert: *See—*
Reifenhauser, Hans; Beisemann, Heinz; Reitemeyer, Paul; and Grabowski, Robert, 4,594,063, Cl. 425-141.000.

Gradenegger, Helmut: *See—*
Krivec, Eduard; and Gradenegger, Helmut, 4,594,047, Cl. 414-565.000.

Graf & Cie. A.G.: *See—*
Graf, Ralph; and Bisquolm, Werner, 4,593,437, Cl. 19-113.000.

Graf, Ralph; and Bisquolm, Werner, to Graf & Cie. A.G. Card flats segment. 4,593,437, Cl. 19-113.000.

Grafton, Harry D. Concrete structures for use in shore protection and/or wave control and method of making same. 4,594,206, Cl. 264-35.000.

Graham, Belvin L., to Carruthers Equipment Co. Pressure relief apparatus. 4,594,066, Cl. 425-151.000.

Graham, Erwin W. Occipital support for cervical traction. 4,593,684, Cl. 128-75.000.

Graham, Karl: *See—*
Wells, Larry; and Graham, Karl, 4,593,659, Cl. 123-90.380.

Grakauskas, Vytautas; Garver, Lee C.; and Baum, Kurt, to United States of America, Air Force. Synthesis of geminal dinitro compounds. 4,594,430, Cl. 549-9.000.

Granite Technological Enterprises, Inc.: *See—*
Lattuada, Charles P., 4,593,650, Cl. 119-15.000.

Graniteville Company: *See—*
McKinney, James M.; and Hodson, John G., 4,594,286, Cl. 428-245.000.

Grassl, Roman; Craig, Thomas A.; and Weil, Eric P., to Galland Henning Nopak, Inc. Mounting means for proximity sensing device. 4,594,487, Cl. 200-82.00E.

Graves, Gordon T., to Syntech International, Inc. Player interactive video gaming device. 4,593,904, Cl. 273-1.00E.

Gray, George W.: *See—*
Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidensschink, Rudolf; and Romer, Michael, 4,594,465, Cl. 568-642.000.

Gray, Harold Z. Power tool fence. 4,593,590, Cl. 83-438.000.

Gray, Leo C. Endotracheal catheter. 4,593,687, Cl. 128-200.260.

Grayco Specialist Tank, Inc.: *See—*
Burke, Edward M., 4,593,763, Cl. 166-302.000.

Great Neck Saw Manufacturing, Inc.: *See—*
Mayes, Daniel J., 4,593,475, Cl. 33-347.000.

Greene, Hugh W.; Holder, James D.; and Roberts, Thomas G., to United States of America, Army. Voltmeter for remotely sensing high voltages. 4,594,546, Cl. 324-122.000.

Greene, Leonard M. Airplane safe take-off rotation indicator. 4,594,592, Cl. 340-959.000.

Greenlee, Donald R., to Dresser Industries, Inc. Tubing resettable well tool. 4,593,765, Cl. 166-387.000.

Greiner, Odin. Picture stand for several pictures. 4,593,876, Cl. 248-469.000.

Greminger, George K., Jr.; and Dehnke, Mary K., to Dow Chemical Company, The. Highly pseudoplastic polymer solutions. 4,594,108, Cl. 106-170.000.

Griffith, John D., to Bonas Machine Company Limited. Heald control apparatus. 4,593,723, Cl. 139-65.000.

Griffiths, John S.: *See—*
Jenkner, Wolfgang R.; Christie, Alan E.; Elsayed, Emad E. M.; Griffiths, John S.; and Mentes, Guney A., 4,594,024, Cl. 405-127.000.

Grimaldi, Pierre; and Trouiller, Jean C., to Schlumberger Technology Corporation. Logging method and apparatus for measuring earth formation resistivity as well as arm mechanism for the same. 4,594,552, Cl. 324-375.000.

Grimm, Robert; and Sowade, Bernd, to Bayer Aktiengesellschaft. Casting powder for the continuous casting of steel and a process for the continuous casting of steel. 4,594,105, Cl. 75-257.000.

Grodinsky, Robert M.; and Cornwell, David G., to RG Dynamics, Inc. Audio amplifier with resistive damping for minimizing time displacement distortion. 4,594,561, Cl. 330-297.000.

Groom, Cheryl V.: *See—*
Padfield, John M.; and Groom, Cheryl V., 4,594,359, Cl. 514-647.000.

Grove Valve and Regulator Co.: *See*—
Seger, Harold C.; and Cowan, Norman M., 4,593,915, Cl. 277-12.000.

Grover, Kent B.: *See*—
Tipton, Craig D.; and Grover, Kent B., 4,594,378, Cl. 524-106.000.

Grujanac, Peter; and Huntington, Clyde, to Lakeside Equipment Corporation. Motorized surface scum skimmer for waste water treatment apparatus. 4,594,156, Cl. 210-145.000.

Gruppo Lepetit S.p.A.: *See*—
Strazzolini, Paolo; Malabarba, Adriano; and Cavalleri, Bruno, 4,594,187, Cl. 530-332.000.
Toja, Emilio; Barone, Domenico; and Baldoli, Emiliana, 4,594,348, Cl. 514-253.000.

GTE Automatic Electric Inc.: *See*—
Perry, Thomas J.; and Khera, Muhammad I., 4,594,712, Cl. 371-49.000.
Perry, Thomas J.; and Khera, Muhammad I., 4,594,713, Cl. 371-49.000.

GTE Government Systems Corporation: *See*—
Guch, Steve, Jr., 4,594,716, Cl. 372-35.000.

GTE Laboratories Incorporated: *See*—
Pappalardo, Romano G.; and Walsh, John, 4,594,178, Cl. 252-301.40P.
Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., 4,593,459, Cl. 29-577.00C.

GTE Products Corporation: *See*—
Scheithauer, Richard A.; Miller, Michael J.; and Vanderpool, Clarence D., 4,594,230, Cl. 423-140.000.
Smith, Todd R., 4,593,514, Cl. 52-648.000.

GTI Corporation: *See*—
Holly, James R., 4,594,673, Cl. 364-522.000.

Guch, Steve, Jr., to GTE Government Systems Corporation. Conduction cooled solid state laser. 4,594,716, Cl. 372-35.000.

Guenthner, Russell W.; Shelly, William A.; Presley-Nelson, Gary R.; Marietta, Kala J.; and Wade, R. Morse, to Honeywell Information Systems Inc. Method and apparatus for prefetching instructions for a central execution pipeline unit. 4,594,659, Cl. 364-200.000.

Guenthner, Russell W.; Edgington, Gregory C.; Trubisky, Leonard G.; and Circello, Joseph C., to Honeywell Information Systems Inc. Collector. 4,594,660, Cl. 364-200.000.

Guerin, Maurice; and Ribaud, Patricia. Continuous digester of the production of biomethane for organic substances. 4,594,078, Cl. 48-111.000.

Guillet, James E., to Allied Corporation. α,β Diketone containing polymers as positive photoresist compositions. 4,594,309, Cl. 430-270.000.

Gullichsen, Johan, to Kamyr AB. Method and an apparatus for treating fibre suspensions. 4,594,152, Cl. 209-273.000.

Gumb, Beverley W.; Freeman, Raymond C.; and Busche, Alan C., to Northern Telecom Limited. Transmitter assembly for a telephone handset. 4,594,478, Cl. 179-103.000.

Gumm, Peter: *See*—
Bardutzky, Bernd; Dinges, Reinhard; and Gumm, Peter, 4,594,068, Cl. 432-60.000.

Gunder, James A. Cartridge resizing apparatus. 4,593,598, Cl. 86-36.000.

Gurke, Reinhard; and Eichel, Manfred, to International Standard Electric Corporation. Amplifier with current-voltage conversion, particularly preamplifier of an optical receiver. 4,594,562, Cl. 330-307.000.

Gusella, James F.; Housman, David; Keys, Cheryl; Varsanyi-Breiner, Aviva; Puck, Theodore T.; Jones, Carol; and Kao, Fa-Ten, to Massachusetts Institute of Technology. Isolation and localization of DNA segments. 4,594,318, Cl. 435-6.000.

Gutekunst, Stanley K.; Scheel, Russell H.; and Ziegenfus, Barry L., to Heico Inc. Reversible, accumulating longitudinal drive tube carrier. 4,593,623, Cl. 104-166.000.

Gutris, Giorgio, to European Electric Motors Design and Engineering Anstalt. Casing for porous self-aligning bushings, and a bearing including the bushed casing. 4,594,009, Cl. 384-203.000.

Guy, Jon S.: *See*—
Liu, Dean-Yuan; Guy, Jon S.; Siu, Howard W. H.; and Shaver, Michael A., 4,594,597, Cl. 346-76.0PH.

H.F. & Ph.F. Reemtsma GmbH & Co.: *See*—
Seidel, Henning; Wildenau, Wolfgang; and Mantke, Joachim, 4,593,707, Cl. 131-336.000.

H-G Toys, Inc.: *See*—
Lebensfeld, Steven, 4,593,618, Cl. 101-375.000.

H. Stoll GmbH and Company: *See*—
Mak, Gerd; and Ploppa, Jurgen, 4,594,585, Cl. 340-679.000.

Haapaniemi, Jarkko: *See*—
Laine, Ensio; and Haapaniemi, Jarkko, 4,593,563, Cl. 73-432.00R.

Haas, Raimund: *See*—
Interthal, Werner; Durst, Franz-Josef; and Haas, Raimund, 4,593,762, Cl. 166-275.000.

Haas, Thomas J.: *See*—
Cronkhite, James D.; Haas, Thomas J.; and Mort, Raymond W., 4,593,870, Cl. 244-117.00R.

Haaser, Robert, to Union Siderurgique du Nord et de l'Est de la France (USINOR). Process and device for manufacturing sheet metal or galvanized steel strip devoid of a pure zinc coating on at least one side. 4,594,272, Cl. 427-349.000.

Habel, David H.: *See*—
Fink, James K.; and Habel, David H., 4,593,536, Cl. 62-239.000.

Hacke, Heinz: *See*—
Hoft, Peter; Peter, Wolfgang; Hacke, Heinz; Luhr, Jurgen; Bergsteiner, Johann; Drobe, Wolfgang; Engelke, Fritz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,593,834, Cl. 220-273.000.

Hackenberg, Hubert: *See*—
Auer, Josef; and Hackenberg, Hubert, 4,593,990, Cl. 355-45.000.

Hackman, Donald J.; Caudy, Don W.; and Nikodem, Leslie F., to Battelle Memorial Institute. Portable balanced motion compensated lift apparatus. 4,593,885, Cl. 254-277.000.

Haferl, Peter E., to RCA Corporation. Horizontal deflection circuit with raster distortion correction. 4,594,534, Cl. 315-408.000.

Haga, Katutoshi; Sasamori, Takehusa; Kurita, Teizi; and Katumata, Noriaki, to Fuji Seiko Limited; and Toyota Jidosha Kabushiki Kaisha. Multi-spindle unit. 4,594,037, Cl. 409-144.000.

Hagemann, Casper W., to Interlake, Inc. Bypass clincher for stitching machine. 4,593,847, Cl. 227-155.000.

Hagiwara, Hideo; and Matsumoto, Hiroshi, to Fuji Photo Film Co., Ltd. Magnetic tape cassette storing case. 4,593,814, Cl. 206-387.000.

Hagiwara, Satoru; Ishizuka, Ichiro; and Okabe, Kazuo, to Toray Industries, Inc. Method for producing a thermoplastic polymeric sheet. 4,594,203, Cl. 264-22.000.

Haitko, Deborah A., to General Electric Company. Copper (I) complexes useful as catalysts for polyphenylene oxide preparation. 4,594,405, Cl. 528-215.000.

Hajime Ishimaru: *See*—
Ishimaru, Hajime; Narushima, Katsuya; and Momose, Takashi, 4,594,054, Cl. 417-49.000.

Hakasaari, Tapio K., to Oy Partek AB. Panel for exterior insulation. 4,593,511, Cl. 52-404.000.

Hakuraku, Yoshinori: *See*—
Kikkawa, Seiichi; Ogata, Hisanao; Hakuraku, Yoshinori; Mase, Masahiro; Tsumaki, Nobuo; Awada, Yoshihisa; and Kajiwara, Hiroki, 4,593,835, Cl. 222-131.000.

Halder, Mathis, to LGZ Landis & Gyr Zug AG. Mark-space amplitude modulator for measuring reactive power consumption or reactive energy consumption. 4,594,547, Cl. 324-141.000.

Halliburton Company: *See*—
Penny, Glenn S., 4,594,200, Cl. 260-512.00R.
Purfurst, Ernest H., 4,593,560, Cl. 73-155.000.

Hama, Tomio; and Yamazaki, Kiyoyasu, to Kabushiki Kaisha Nihon Pisco. Tubing joint. 4,593,943, Cl. 285-308.000.

Hamada, Toyohide: *See*—
Sugimoto, Koichi; Koizumi, Kiyohide; Hamada, Toyohide; and Arai, Shinichi, 4,594,671, Cl. 364-513.000.

Hamada, Yoshinori, to Showa Denko Kabushiki Kaisha. Propylene polymer composition. 4,594,376, Cl. 524-101.000.

Hamamatsu University School of Medicine: *See*—
Yoshida, Takato; Haraguchi, Soichi; Hongo, Teruaki; and Koide, Yukio, 4,594,245, Cl. 424-101.000.

Hamer, Arthur; and Pardoe, Beverley H., to National Research Development Corporation. Reactive load drive and surge protection. 4,594,636, Cl. 361-152.000.

Hamilton, Douglas D., to Logging Development Corporation. Tree felling head having a rim driven rotary cutter. 4,593,733, Cl. 144-34.00R.

Hammon, Ulrich: *See*—
Hoelderich, Wolfgang; Riekert, Lothar; Kotter, Michael; and Hammon, Ulrich, 4,594,332, Cl. 502-64.000.

Hanada, Tsuneo; and Morita, Yoshitsugu, to Toray Silicone Company, Limited. Method for preparing a spherical cured polymer or a composition thereof containing linear organopolysiloxane blocks. 4,594,134, Cl. 522-99.000.

Hanak, Joseph J., to RCA Corporation. Continuous in-line deposition system. 4,593,644, Cl. 118-719.000.

Hans and Fritz Stahlecker: *See*—
Barauke, Norbert, 4,593,438, Cl. 19-261.000.

Hanula, Richard M.; and Jwuc, Karl J. Rotary railroad car F coupler. 4,593,828, Cl. 213-62.00A.

Hao, Hsieh T.; Ling, Huei; Sachar, Howard E.; Weiss, Jeffrey; and Yamour, Yannis J., to International Business Machines Corporation. (k)-Instructions-at-a-time pipelined processor for parallel execution of inherently sequential instructions. 4,594,655, Cl. 364-200.000.

Harada, Tuneo: *See*—
Oyama, Kiyotaka; and Harada, Tuneo, 4,594,450, Cl. 562-496.000.

Haraga, Kousuke; Hattori, Katutoshi; and Yamamoto, Kazumi, to Mitsubishi Denki Kabushiki Kaisha. Lightweight impact absorbing panel. 4,594,281, Cl. 428-172.000.

Haraguchi, Soichi: *See*—
Yoshida, Takato; Haraguchi, Soichi; Hongo, Teruaki; and Koide, Yukio, 4,594,245, Cl. 424-101.000.

Harano, Fumio; Kaneta, Shigeyoshi; Nakagaki, Kunihiro; and Nishiyama, Satoshi, to Sumitomo Electric Industries, Ltd. Apparatus for the production of laminated sheath cables. 4,594,124, Cl. 156-468.000.

Harbison, William C.: *See*—
Fischer, William F.; LeMasters, Donald P.; and Harbison, William C., 4,594,290, Cl. 428-212.000.

Hareng, Michel: *See*—
Mourey, Bruno; and Hareng, Michel, 4,593,978, Cl. 350-339.00F.

Harigane, Kotaro: *See*—
Yagi, Hiroshi; Fujita, Hisashi; and Harigane, Kotaro, 4,593,462, Cl. 29-740.000.

Harrah, Larry A.; and Renschler, Clifford L., to United States of America, Energy. Reduction of reabsorption effects in scintillators by employing solutes with large Stokes shifts. 4,594,179, Cl. 252-301.170.

Harrah, Shane; and Phy, William, to Fairchild Camera & Instrument Corp. Method and apparatus for forming ball bonds. 4,594,493, Cl. 219-56.220.

Harris Corporation: *See—*
Catherwood, Robert, Sr., 4,594,082, Cl. 55-316.000.
Van Vonno, Nicolaas W.; Hull, Richard; and Reinecke, Paul S., 4,594,265, Cl. 427-53.100.

Harris, Eugene G.: *See—*
Cahill, Joseph, Jr.; and Harris, Eugene G., 4,594,434, Cl. 549-267.000.

Harris, James E.: *See—*
Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., 4,594,404, Cl. 528-174.000.

Hartman, Robert A.: *See—*
Dilts, David A.; and Hartman, Robert A., 4,593,455, Cl. 29-572.000.

Hartman, Thomas W.; and Ryan, Thomas G., to Cyclops Corporation. Cellular flooring system and method of using same. 4,593,506, Cl. 52-221.000.

Hartman, Thomas W., to Cyclops Corporation. Trenchless underfloor conduit system. 4,593,507, Cl. 52-221.000.

Hartmetallwerkzeugfabrik Andreas Maier GmbH & Co. KG: *See—* Maier, Andreas, 4,594,034, Cl. 408-230.000.

Harwood, Colin F.: *See—*
Pall, David B.; Harwood, Colin F.; Bradley, Arthur; and Brennan, Timothy R., 4,594,202, Cl. 264-8.000.

Hasegawa, Taiji: *See—*
Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Osamu; and Hasegawa, Taiji, 4,593,663, Cl. 123-440.000.

Hashimoto, Kazuyoshi; Takemasa, Toshihiro; and Taniguchi, Nobuyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of correcting distortions in a rolled strip product. 4,593,548, Cl. 72-12.000.

Hashimoto, Koichi, to Glory Kogyo Kabushiki Kaisha. Cash processing method and system. 4,594,664, Cl. 364-405.000.

Hashimoto, Tadanori; Yoshitake, Hiroshi; Yokoyama, Hiroyuki; and Nakazono, Akiko, to Sumitomo Chemical Company, Ltd. Indium tin oxide sol composition. 4,594,182, Cl. 252-518.000.

Hasker, Jan; Hokkeling, Pieter; van Esdonk, Johannes; and van Lith, Josef J., to U.S. Philips Corporation. Method of manufacturing a scandate dispenser cathode and dispenser cathode manufactured by means of the method. 4,594,220, Cl. 419-27.000.

Hassler, Ernst: *See—*
Stich, Bodo; Hassler, Ernst; Adamowicz, Slawomir; and Cyphelly, Ivan J., 4,593,715, Cl. 137-503.000.

Hata, Kotaro: *See—*
Nakayama, Akira; Nakamura, Katsuya; Hata, Kotaro; and Yamamoto, Makoto, 4,594,174, Cl. 252-62.540.

Hatae, Yasuhiko; and Morimitsu, Shigeaki, to Hitachi Denshi System Service Kabushiki Kaisha. TV-photography system for surgical microscope. 4,594,608, Cl. 358-93.000.

Hatakeyama, Hideharu; and Takahashi, Hidenao, to Sanden Corporation. Piston assembly for a refrigerant compressor. 4,594,055, Cl. 417-269.000.

Hatch, Gary L., to Ametek, Inc. - Plymouth Products Division. Synergistically stabilized mixed form halogenated and/or interhalogenated resins for disinfecting water. 4,594,392, Cl. 525-327.100.

Hattori, Katutoshi: *See—*
Haraga, Kousuke; Hattori, Katutoshi; and Yamamoto, Kazumi, 4,594,281, Cl. 428-172.000.

Haubner, Georg; Zobt, Hartmut; and Petermann, Hans, to Robert Bosch GmbH. Optical multiple output display system, particularly for automotive dashboards. 4,594,572, Cl. 340-52.00F.

Hauer, Jean-Claude; and Oger, Jacques, to Pont-A-Mousson S.A. Wedge member for assembling tunnel shield voussoirs. 4,594,026, Cl. 405-153.000.

Haugen, Paul R., to Honeywell Inc. 3-D active vision sensor. 4,593,967, Cl. 350-3.710.

Hauni-Werke Korber & Co. KG.: *See—*
Wahle, Gunter; Ludszeweit, Dieter; and Heitmann, Uwe, 4,593,704, Cl. 131-84.300.

Hawera Probst GmbH & Co.: *See—*
Peetz, Wolfgang; Klaissle, Siegfried; Moser, Bernhard; and Muller, Norbert, 4,594,033, Cl. 408-156.000.

Hawes, David J., to Allied Corporation. Method and apparatus for acceleration limiting a gas turbine engine. 4,593,523, Cl. 60-39.281.

Hayakawa, Yoshihiro; Nakamura, Yasuhiro; Tachita, Ryobun; and Yano, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Ultrasonic wave blood flow meter. 4,593,700, Cl. 128-663.000.

Hayashi, Ikuo; Itikawa, Tadao; and Shimizu, Kiyoshi, to Nitto Boseki Co., Ltd. Producing sequential polyamino acid resin. 4,594,409, Cl. 528-328.000.

Hayashi, Mikio, to Seikosha Co., Ltd. Ink cartridge changeover device in an ink ribbon cassette for a printer. 4,594,011, Cl. 400-200.000.

Hayner, Paul F. Method of manufacturing a fluid flow restrictor. 4,593,446, Cl. 29-157.00R.

Hayward Industries, Inc.: *See—*
Tobias, Samuel; and Messinger, Robert M., 4,593,420, Cl. 4-496.000.

Hazelett, Robert W.; Petry, Charles J.; and Platek, Stanley W., to Hazelett Strip-Casting Corporation. Apparatus for feeding and continuously casting molten metal with inert gas applied to the moving mold surfaces and to the entering metal. 4,593,742, Cl. 164-415.000.

Hazelett Strip-Casting Corporation: *See—*
Hazelett, Robert W.; Petry, Charles J.; and Platek, Stanley W., 4,593,742, Cl. 164-415.000.

Hazenbroek, Jacobus E., to Systemate Holland B.V. Filleting apparatus. 4,593,432, Cl. 17-46.000.

Headrick, Richard T. Solar generator mounting structure. 4,594,470, Cl. 136-246.000.

Hebbinghaus, Walter: *See—*
Hoft, Peter; Peter, Wolfgang; Hacke, Heinz; Luhr, Jurgen; Bergsteiner, Johann; Drobe, Wolfgang; Engelke, Fritz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,593,834, Cl. 220-273.000.

Heck, Frank W.; Donachie, Stephen J.; and Merrick, Howard F., to Inco Alloys International, Inc. Dispersion strengthened low density MA-Al. 4,594,222, Cl. 420-529.000.

Heckele, Helmut, to Richard Wolf GmbH. Endoscope. 4,593,682, Cl. 128-6.000.

Hefer, Fred W., to Oyo Corporation. Printed-circuit disc for stringing geophones. 4,594,698, Cl. 367-188.000.

Hefner, James L.: *See—*
George, Steven L.; and Hefner, James L., 4,594,679, Cl. 364-754.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Unsaturated polyester (amide)s containing thiabicyclononane groups. 4,594,408, Cl. 528-290.000.

Heiberger, Francis E., to Danly Machine Corporation. Hydraulic overload control system for power presses. 4,593,547, Cl. 72-1.000.

Heico Inc.: *See—*
Gutekunst, Stanley K.; Scheel, Russell H.; and Ziegenfus, Barry L., 4,593,623, Cl. 104-166.000.

Heidenreich, Klaus; Depcik, Hans-Werner; and Radojewski, Hans, to Bayer Aktiengesellschaft. Process for annealing thermoplastically-shaped plastics parts. 4,594,204, Cl. 264-25.000.

Heilmeier & Weinlein, Fabrik fur Oel-Hydraulik GmbH & Co., KG: *See—*
Brunner, Rudolf, 4,594,056, Cl. 417-271.000.

Heimbrodt, Klaus-Juergen: *See—*
Claar, Klaus; Heimbrodt, Klaus-Juergen; and Kurth, Hermann, 4,593,544, Cl. 70-264.000.

Heinemann, Henning: *See—*
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,594,436, Cl. 549-359.000.

Heitkamper, Peter: *See—*
Findeisen, Kurt; Konig, Klaus; Fauss, Rudolf; and Heitkamper, Peter, 4,594,441, Cl. 560-25.000.

Heitmann, Hans-Gunter; and Rupp, Gunter, to Kraftwerk Union Aktiengesellschaft. Magnetizable separator for the purification of liquids. 4,594,160, Cl. 210-222.000.

Heitmann, Uwe: *See—*
Wahle, Gunter; Ludszeweit, Dieter; and Heitmann, Uwe, 4,593,704, Cl. 131-84.300.

Helland Research & Engineering, Inc.: *See—*
Ness, Joseph M.; and Gerads, Lyle J., 4,593,800, Cl. 192-56.00R.

Henderson, James A., Jr.: *See—*
Townsend, Greg M.; and Henderson, James A., Jr., 4,594,633, Cl. 361-57.000.

Henneke, Karl-Wilhelm; Diehl, Herbert; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Preparation of 3,5-dichloro-α-methylstyrene. 4,594,467, Cl. 570-193.000.

Henning, Georg, to BASF Aktiengesellschaft. Sulfonated monoazo colorant lake obtained by di-azo coupling of 5-acetylamino-2-aminobenzene-1-sulfonic acid with 1-(3'-sulfophenyl)-3-methylphyrazol-5-one. 4,594,411, Cl. 534-784.000.

Henry, Dale V.; and Kaiser, Donald B., to RCA Corporation. Modular welding apparatus having two movable welding electrodes. 4,594,494, Cl. 219-86.800.

Henry, Donald D. Heating unit. 4,593,628, Cl. 110-101.00R.

Hepp, James. Adjustable knockdown tray assembly. 4,593,825, Cl. 211-126.000.

Hercules Incorporated: *See—*
Berta, Dominick A., 4,594,396, Cl. 525-352.000.

Hermann, Adam, to Siemens Aktiengesellschaft. Device for fixing a cooling member on the cooling surface of an integrated module. 4,594,643, Cl. 361-386.000.

Hermes Precisa International S.A.: *See—*
Costa, Jorge; and Reichel, Wolfgang, 4,594,013, Cl. 400-625.000.

Hernandez, Jorge M., to Rogers Corporation. Decoupling capacitor and method of formation thereof. 4,594,641, Cl. 361-306.000.

Herrmann, Heinz: *See—*
Vollmann, Hansjoerg; and Herrmann, Heinz, 4,594,305, Cl. 430-115.000.

Hess, Donald J.: *See—*
Clinton, William D.; and Hess, Donald J., 4,594,166, Cl. 210-107.000.

Hesse, Karl-Heinz: *See—*
Neuhaus, Detlev; Hesse, Karl-Heinz; Ruhnau, Gerhard; and Liermann, Peter, 4,594,571, Cl. 340-52.00F.

Hettinger, Peter: *See—*
Merger, Franz; Hettinger, Peter; Hupfer, Leopold; and Paetsch, Juergen, 4,594,461, Cl. 568-853.000.

Hewlett-Packard Company: *See—*
Hilton, Howard E., 4,594,555, Cl. 329-135.000.

Heyse, Klaus: *See—*
Klenk, Ludwig; and Heyse, Klaus, 4,593,721, Cl. 138-118.100.
Schad, Alfred; and Heyse, Klaus, 4,593,853, Cl. 237-56.000.

Hi-Shear Corporation: *See—*
Singleton, Arthur M., 4,593,583, Cl. 81-57.140.

Hibino, Akira: *See*—
Nakamura, Taku; Hibino, Akira; Shibata, Takeshi; and Nakamura, Koichi, 4,594,308, Cl. 430-213.000.
Hidano, Kengo, to Nippon Thompson Co., Ltd. Rolling bearing made by thin steel plates for providing a rectilinear movement. 4,593,957, Cl. 384-49.000.
Higashi, James Y.: *See*—
Earman, Allen M.; and Higashi, James Y., 4,594,701, Cl. 369-43.000.
Higuchi, Masahiro: *See*—
Miyauchi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,594,269, Cl. 427-150.000.
Higuchi, Toyoki: *See*—
Kawakyu, Yoshito; Higuchi, Toyoki; and Ito, Hiroshi, 4,594,528, Cl. 313-503.000.
Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Magnetic reproduce apparatus with magnetoresistive head. 4,594,619, Cl. 360-74.400.
Hill, Charles A. Vessel handle attachment. 4,593,833, Cl. 220-94.00R.
Hill, Kevin E., to Milsco Manufacturing Company. Tethered vehicle operator's seat having wide range of fore and aft adjustment. 4,593,875, Cl. 248-429.000.
Hills, Robert A., to Altech Industries, Inc. Joist hanger and blank therefor. 4,594,017, Cl. 403-6.000.
Hilti Aktiengesellschaft: *See*—
Hoyss, Franz; and Reitberger, Rudolf, 4,594,035, Cl. 408-234.000.
Hilton, Howard E., to Hewlett-Packard Company. Frequency selective sampling detector. 4,594,555, Cl. 329-135.000.
Hirai, Masaharu: *See*—
Honma, Ichiro; Hirai, Masaharu; Amano, Masatoshi; and Takumi, Nobusuke, 4,594,267, Cl. 427-127.000.
Hiraizumi, Junichi, to Kioritz Corporation. Air cleaner. 4,594,083, Cl. 55-385.0BR.
Hiraoka, Tutomu: *See*—
Yamamoto, Mitsuo; Kinumoto, Namio; Tsuji, Toshinori; and Hiraoka, Tutomu, 4,593,722, Cl. 138-145.000.
Hirate, Shintaro: *See*—
Asayama, Yoshiaki; Yamada, Tetsuyo; and Hirate, Shintaro, 4,594,139, Cl. 204-410.000.
Hirayama, Mamoru: *See*—
Nagata, Masanori; Inoue, Toshiaki; and Hirayama, Mamoru, 4,594,663, Cl. 364-401.000.
Hirose, Masayuki: *See*—
Adachi, Hideki; Tomosada, Masahiro; Hirose, Masayuki; Miyata, Masanori; and Komiya, Yutaka, 4,593,999, Cl. 355-55.000.
Hiruta, Osamu: *See*—
Suzuki, Shoichi; Kurobe, Moriji; Araga, Toshima; and Hiruta, Osamu, 4,594,112, Cl. 148-6.14R.
Hitachi Cable, Ltd.: *See*—
Kobayashi, Kenji; Yasuda, Tsutomu; Matsumoto, Hiroshi; and Sone, Humiki, 4,593,701, Cl. 128-667.000.
Hitachi Chemical Co. Ltd.: *See*—
Tomisawa, Yoshiaki; Kinoda, Seiji; Fujita, Eiji; Murata, Masanori; Takeuchi, Toshio; and Ogawa, Ken, 4,593,986, Cl. 354-324.000.
Hitachi Denshi Engineering Kabushiki Kaisha: *See*—
Kawano, Hikaru; Sato, Koji; and Nogi, Hiroyoshi, 4,594,043, Cl. 414-43.000.
Hitachi Denshi System Service Kabushiki Kaisha: *See*—
Hatae, Yasuhiko; and Morimitsu, Shigeaki, 4,594,608, Cl. 358-93.000.
Hitachi, Ltd.: *See*—
Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Osamu; and Hasegawa, Taiji, 4,593,663, Cl. 123-440.000.
Iimura, Kenji; and Nakashima, Yoichi, 4,594,602, Cl. 357-13.000.
Itoh, Masaaki; Kogure, Hiroshi; Iino, Kenji; Ochiai, Izumi; Kitayama, Yukio; and Miyagi, Masahiro, 4,593,756, Cl. 165-151.000.
Kikkawa, Seiichi; Ogata, Hisanao; Hakuraku, Yoshinori; Mase, Masahiro; Tsumaki, Nobuo; Awada, Yoshihisa; and Kajiwara, Hiroki, 4,593,835, Cl. 222-131.000.
Noguchi, Takaharu; Yamazaki, Shigeru; and Arai, Takao, 4,594,621, Cl. 360-77.000.
Shimizu, Yukiaki; and Oouchi, Kei, 4,593,625, Cl. 105-182.00R.
Sugimoto, Koichi; Koizumi, Kiyohide; Hamada, Toyohide; and Arai, Shinichi, 4,594,671, Cl. 364-513.000.
Takahashi, Tadashi; Miyashita, Kunio; Kawamata, Syooichi; and Morinaga, Shigeki, 4,594,548, Cl. 324-208.000.
Takahashi, Youichi; Kashiwakura, Koji; Morisawa, Junichiro; and Kobayashi, Masahiro, 4,594,497, Cl. 219-130.210.
Hobart Corporation: *See*—
Margraf, Dallas A., 4,593,515, Cl. 53-56.000.
Hobgood, Hudson M.; Thomas, Richard N.; and Barrett, Donovan L., to Westinghouse Electric Corp. Indium doped gallium arsenide crystals and method of preparation. 4,594,173, Cl. 252-62.3GA.
Hochbein, David E., to Aluminum Company of America. Button contact joining machine. 4,593,848, Cl. 228-2.000.
Hochmair, Erwin S.: *See*—
Hochmair, Ingeborg J.; and Hochmair, Erwin S., 4,593,696, Cl. 128-419.00R.
Hochmair, Ingeborg J.; and Hochmair, Erwin S. Auditory stimulation using CW and pulsed signals. 4,593,696, Cl. 128-419.00R.
Hodogaya Chemical Co., Ltd.: *See*—
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Gonda, Michihiro; Kanasugi, Mikiko; and Obara, Toshio, 4,594,601, Cl. 346-221.000.
Hodson, John G.: *See*—
McKinney, James M.; and Hodson, John G., 4,594,286, Cl. 428-245.000.
Hoechst Aktiengesellschaft: *See*—
Albrecht, Konrad; and Frisch, Gerhard, 4,594,096, Cl. 71-93.000.
Bardutzky, Bernd; Dinges, Reinhard; and Gumm, Peter, 4,594,068, Cl. 432-60.000.
Bauer, Klaus; Bieringer, Hermann; Burstell, Helmut; and Kocur, Jean, 4,594,098, Cl. 71-86.000.
Bohn, Hans; and Winckler, Wilhelm, 4,594,328, Cl. 436-543.000.
Interthal, Werner; Durst, Franz-Josef; and Haas, Raimund, 4,593,762, Cl. 166-275.000.
Klenk, Ludwig; and Heyse, Klaus, 4,593,721, Cl. 138-118.100.
Schad, Alfred; and Heyse, Klaus, 4,593,853, Cl. 237-56.000.
Spietschka, Ernst; and Troster, Helmut, 4,594,420, Cl. 546-29.000.
Stahlhofen, Paul; and Beutel, Rainer, 4,594,306, Cl. 430-166.000.
Vollmann, Hansjoerg; and Herrmann, Heinz, 4,594,305, Cl. 430-115.000.
Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Glamkowski, Edward J.; and Jones, Michael C., deceased, 4,594,435, Cl. 549-345.000.
Hoefke, Wolfgang: *See*—
Koppe, Herbert; Abele, Wolfgang, deceased; Esser, Franz; Gaida, Wolfram; and Hoefke, Wolfgang, 4,594,344, Cl. 514-222.000.
Hoehn, Gustave L., Jr., to Mobil Oil Corporation. Method for preventing the drilling of a new well into one of a plurality of production wells. 4,593,770, Cl. 175-45.000.
Hoelderich, Wolfgang; Riekert, Lothar; Kotter, Michael; and Hammon, Ulrich, to BASF Aktiengesellschaft. Preparation of hard, fracture-resistant catalysts from zeolite powder. 4,594,332, Cl. 502-64.000.
Hoenig, Stephen M.; Flores, David P.; and O'Connell, Gregory S., to Dow Chemical Company, The. Thermally stabilized carboxyl-containing ethylene copolymers and preparation thereof. 4,594,382, Cl. 524-400.000.
Hoffman-La Roche Inc.: *See*—
Baggiolini, Enrico G.; Uskokovic, Milan R.; and Wovkulich, Peter M., 4,594,432, Cl. 549-214.000.
LeMahieu, Ronald A., 4,594,442, Cl. 560-053.000.
Hoffman, Wayne C., to Pitney Bowes Inc. Device for stacking microcassettes. 4,594,042, Cl. 414-32.000.
Hoffmann-La Roche Inc.: *See*—
Berger, Julius, 4,594,354, Cl. 514-460.000.
Partridge, John J.; Shiuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., 4,594,340, Cl. 514-167.000.
Hoft, Peter; Peter, Wolfgang; Hacke, Heinz; Luhr, Jurgen; Bergsteiner, Johann; Drobe, Wolfgang; Engelke, Fritz; Hebbinghaus, Walter; and Kuhnert, Siegfried, to Schmalbach-Lubeca AG. Opening means for oblong cans. 4,593,834, Cl. 220-273.000.
Hogan, Thomas C., to Prime Computer, Inc. Bypass method and apparatus for debouncing a mechanical switching element in a data communications network. 4,594,724, Cl. 375-7.000.
Hogendobler, Richard S.: *See*—
Forney, Edgar W., Jr.; and Hogendobler, Richard S., 4,593,964, Cl. 339-177.00R.
Hogenhout, Franciscus, to Muzzy, Kenneth R. Quick change tool chuck system. 4,594,036, Cl. 408-240.000.
Hohage, Heinz-Juergen, to Rohm GmbH Chemische Fabrik. Esters of vinylcarboxylic acids. 4,594,448, Cl. 560-220.000.
Hokanson, Gerard C.: *See*—
Wilton, John H.; Hokanson, Gerard C.; and French, James C., 4,594,248, Cl. 424-117.000.
Hokkeling, Pieter: *See*—
Hasker, Jan; Hokkeling, Pieter; van Esdonk, Johannes; and van Lith, Josef J., 4,594,220, Cl. 419-27.000.
Holder, James D.: *See*—
Greene, Hugh W.; Holder, James D.; and Roberts, Thomas G., 4,594,546, Cl. 324-122.000.
Holl, Richard A. Shell and tube heat transfer apparatus and process therefor. 4,593,754, Cl. 165-109.100.
Hollis, Nathaniel. Locking electrical outlet box. 4,593,541, Cl. 70-57.000.
Holly, James R., to GTI Corporation. Hidden surface processor. 4,594,673, Cl. 364-522.000.
Holonyak, Nick, Jr., to University of Illinois, Board of Trustees of The. Semiconductor device with disordered active region. 4,594,603, Cl. 357-16.000.
Holzhauser, Ronald C., to Eastman Kodak Company. Method and apparatus for producing multiple sets of copies of a document. 4,593,995, Cl. 355-3.00R.
Honaga, Susumu; Suzuki, Mikio; and Inaguma, Yoshiharu, to Toyoda Koki Kabushiki Kaisha. Power steering system. 4,593,783, Cl. 180-141.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ariga, Yoshio; and Watanabe, Shinpei, 4,593,850, Cl. 228-47.000.
Kishi, Noriyuki, 4,593,665, Cl. 123-478.000.
Nobusawa, Hiroshi; Hosoya, Eiji; Imaizumi, Masahiro; and Takasu, Hitoyuki, 4,593,782, Cl. 180-88.000.
Yamamoto, Sadashi; and Ishihara, Takeo, 4,593,785, Cl. 180-291.000.
Honda, Tsugunori: *See*—
Saito, Yoshizi; Nakamura, Masaru; Iida, Toyoshi; and Honda, Tsugunori, 4,594,169, Cl. 252-8.50C.
Honegger, Werner, to Ferag AG. Winding mandrel for a coil or wound package formed of flexible, substantially flat products, especially printed products. 4,593,865, Cl. 242-67.10R.
Honeywell Inc.: *See*—
Haugen, Paul R., 4,593,967, Cl. 350-3.710.

Honeywell Information Systems Inc.: *See—*
Guenthner, Russell W.; Shelly, William A.; Presley-Nelson, Gary R.; Marietta, Kala J.; and Wade, R. Morse, 4,594,659, Cl. 364-200.000.
Guenthner, Russell W.; Edgington, Gregory C.; Trubisky, Leonard G.; and Circello, Joseph C., 4,594,660, Cl. 364-200.000.
Hongo, Teruaki: *See—*
Yoshida, Takato; Haraguchi, Soichi; Hongo, Teruaki; and Koide, Yukio, 4,594,245, Cl. 424-101.000.
Honma, Ichiro; Hirai, Masaharu; Amano, Masatoshi; and Takumi, Nobusuke, to Ishihara Sangyo Kaisha, Ltd. Process for producing cobalt-containing magnetic iron oxide powder. 4,594,267, Cl. 427-127.000.
Hooper, Anthony W.; and Cormack, Alexander D., to Uniweld Inc. Hold down and sealing assembly for discharger mechanism. 4,594,045, Cl. 414-325.000.
Horiba, Ltd.: *See—*
Ishida, Kozo; Okayama, Junji; and Otsuki, Kunio, 4,594,004, Cl. 356-433.000.
Horie, Seiji; Nagata, Masayoshi; Nakano, Junji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Electrophotographic photoreceptor. 4,594,303, Cl. 430-59.000.
Horie, Seiji: *See—*
Watarai, Shu; and Horie, Seiji, 4,594,304, Cl. 430-59.000.
Horigome, Hirofumi: *See—*
Akiyama, Hideaki; Iguchi, Susumu; and Horigome, Hirofumi, 4,593,988, Cl. 354-409.000.
Horikoshi, Yukio: *See—*
Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,594,062, Cl. 418-173.000.
Horita, Tsuyoshi; Nakatsuka, Yoji; Fujiwara, Kenzou; Takeuchi, Norio; Nakanishi, Yuji; and Murasato, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Armature winding of a split stator for a rotary electric machine. 4,594,523, Cl. 310-42.000.
Horita, Tsuyoshi: *See—*
Fujiwara, Kenzo; Takeuchi, Norio; Nakatsuka, Yoji; Horita, Tsuyoshi; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,522, Cl. 310-42.000.
Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Friction reducing additives and compositions thereof. 4,594,171, Cl. 252-49.600.
Hosaka, Akio, to Nissan Motor Co., Ltd. Ice control method including control schedule update. 4,594,669, Cl. 364-431.050.
Hose America, Inc.: *See—*
Campanini, Sergio, 4,593,954, Cl. 303-7.000.
Hoshino, Kazuo: *See—*
Maruhashi, Shigeaki; Hoshino, Kazuo; Uematsu, Yoshihiro; Miyakusu, Katsuhisa; and Fujimura, Takehiko, 4,594,114, Cl. 148-12.0EA.
Hosler, Peter, to Sun Refining and Marketing Company. Extraction of aromatics with ethyl acetoacetate. 4,594,148, Cl. 208-332.000.
Hosogoe, Junichi, to Alps Electric Co., Ltd. X-Y position input device for display system. 4,594,586, Cl. 340-710.000.
Hosoya, Eiji: *See—*
Nobusawa, Hiroshi; Hosoya, Eiji; Imaizumi, Masahiro; and Takasu, Hitoyuki, 4,593,782, Cl. 180-88.000.
Hosoya, Masahiro: *See—*
Tamura, Sakae; Hosoya, Masahiro; Matsuo, Takeshi; and Uehara, Tsutomu, 4,593,994, Cl. 355-3.0SC.
Hostatter, Alfred F.; Lichti, Wayne P.; and Papp, John G., to Metals, Ltd. Powder metal consolidation of multiple preforms. 4,594,219, Cl. 419-8.000.
Hostetler, Dewey L., to DewEze Manufacturing, Inc. Truck bed bale lift. 4,594,041, Cl. 414-24.500.
Housman, David: *See—*
Gusella, James F.; Housman, David; Keys, Cheryl; Varsanyi-Breiner, Aviva; Puck, Theodore T.; Jones, Carol; and Kao, Fa-Ten, 4,594,318, Cl. 435-6.000.
Hovland, Helge: *See—*
Berge, Odd; and Hovland, Helge, 4,593,614, Cl. 99-538.000.
Howell, William G.: *See—*
Brettle, Jack; Lodge, Kevin J.; Loggie, Nicholas J.; Hughes, Simon M. P.; and Howell, William G., 4,594,472, Cl. 174-35.0GC.
Hoy, Kenneth L.: *See—*
Taylor, Glenn A.; and Hoy, Kenneth L., 4,594,366, Cl. 521-137.000.
Hoyer, Elmer A.: *See—*
Avery, James M.; and Hoyer, Elmer A., 4,594,575, Cl. 340-347.0AD.
Hoyss, Franz; and Reitberger, Rudolf, to Hilti Aktiengesellschaft. Drilling stand. 4,594,035, Cl. 408-234.000.
Hoyt, Donald L., to Texaco Inc. Miscible oil flooding at controlled velocities. 4,593,761, Cl. 166-268.000.
Hoyt, John M.: *See—*
Pritchett, Ervin G.; and Hoyt, John M., 4,594,393, Cl. 525-330.300.
Hubner, Klaus-Dieter; Oettinghaus, Dieter; and Stanek, Wolfram. Permanent magnetic charge taking or holding device. 4,594,568, Cl. 335-289.000.
Hubner, Walter: *See—*
Kunze, Siegmar; Losch, Gunter; Dippel, Theodor; Laske, Dietrich; and Hubner, Walter, 4,594,186, Cl. 252-628.000.
Hucke, Edward E., to Union Oil Company of California. Densified carbonaceous bodies with improved surface finishes. 4,594,287, Cl. 428-320.200.
Huddle, Herbert C., to Campbell Soup Company. System for sorting containers. 4,593,805, Cl. 198-381.000.
Hudson Wire Company: *See—*
Inagaki, Tom, 4,594,116, Cl. 148-12.70C.
Hue, Jean: *See—*
Salomon, George P. J.; and Hue, Jean, 4,593,927, Cl. 280-615.000.
Huertgen, Helmut B., to Sutton Engineering Co. Butt shear with butt knocker. 4,593,552, Cl. 72-255.000.
Hughes Aircraft Company: *See—*
Jensen, John E., 4,594,264, Cl. 427-53.100.
Hughes, Rodney F., to Mega Industrial Products, Inc. Welded oil well pump rod. 4,594,020, Cl. 403-343.000.
Hughes, Simon M. P.: *See—*
Brettle, Jack; Lodge, Kevin J.; Loggie, Nicholas J.; Hughes, Simon M. P.; and Howell, William G., 4,594,472, Cl. 174-35.0GC.
Hull, Richard: *See—*
Van Vonno, Nicolaas W.; Hull, Richard; and Reinecke, Paul S., 4,594,265, Cl. 427-53.100.
Hummel, Roger L., to Universal Metal Industries. Switching circuit. 4,594,515, Cl. 307-252.00B.
Humphreys, Richard G.: *See—*
Elliott, Charles T.; Humphreys, Richard G.; and Watton, Rex, 4,594,507, Cl. 250-331.000.
Humpolik, Bohumil; Ingelmann, Hans-Joachim; and Staffa, Karl-Heinz, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Evaporator, in particular for automotive air conditioning systems. 4,593,539, Cl. 62-504.000.
Huntington, Clyde: *See—*
Grujanac, Peter; and Huntington, Clyde, 4,594,156, Cl. 210-145.000.
Hupfer, Leopold: *See—*
Merger, Franz; Hettinger, Peter; Hupfer, Leopold; and Paetsch, Juergen, 4,594,461, Cl. 568-853.000.
Hurd, Jeffery L.: *See—*
Ciszek, Theodore F.; and Hurd, Jeffery L., 4,594,229, Cl. 422-246.000.
Hurtig, Carl R., to Encor, Limited. Adjustable wrench. 4,593,585, Cl. 81-98.000.
Husbands, Calvin G. Flip card file holder. 4,594,016, Cl. 402-75.000.
Hussmann Corporation: *See—*
Tipton, Larry J., 4,593,752, Cl. 165-48.100.
Hutter, Heinrich, to U.S. Philips Corporation. Rotary scanning tape recorder with improved head drum clamping. 4,594,623, Cl. 360-84.000.
Hydraroll Limited: *See—*
Cook, Kenneth, 4,593,810, Cl. 198-781.000.
Hydrasearch Co., Inc.: *See—*
Loker, Ernest B., 4,593,942, Cl. 285-253.000.
Hynes, Martin D., to Eli Lilly and Company. Analgesic method. 4,594,358, Cl. 514-651.000.
I.C.C. -Integrated Camera Complements s.r.l.: *See—*
Rosset, Ivo, 4,593,982, Cl. 354-99.000.
Ibrahim, Baky B. Geometric puzzle. 4,593,908, Cl. 273-153.00S.
Ichimura, Takeshige: *See—*
Ueno, Masakazu; and Ichimura, Takeshige, 4,594,261, Cl. 427-39.000.
Ichinohe, Shoji: *See—*
Takahashi, Kozo; Tahaka, Yasuharu; Isobe, Kenichi; and Ichinohe, Shoji, 4,594,401, Cl. 526-279.000.
ICI Australia Limited: *See—*
Curtin, David J.; and Yates, David E., 4,594,118, Cl. 149-2.000.
Igarashi, Shinichi, to Diesel Kiki Co., Ltd. Injection timing control device for distributor-type fuel injection pumps. 4,593,669, Cl. 123-502.000.
Iguchi, Susumu: *See—*
Akiyama, Hideaki; Iguchi, Susumu; and Horigome, Hirofumi, 4,593,988, Cl. 354-409.000.
Iida, Toyoshi: *See—*
Saito, Yoshizi; Nakamura, Masaru; Iida, Toyoshi; and Honda, Tsugunori, 4,594,169, Cl. 252-8.50C.
Iimura, Kenji; and Nakashima, Yoichi, to Hitachi, Ltd. High speed diode. 4,594,602, Cl. 357-13.000.
Iino, Kenji: *See—*
Itoh, Masaaki; Kogure, Hiroshi; Iino, Kenji; Ochiai, Izumi; Kitayama, Yukio; and Miyagi, Masahiro, 4,593,756, Cl. 165-151.000.
Iizuka, Haruhiko: *See—*
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,594,583, Cl. 340-576.000.
Iizuka, Tetsuya: *See—*
Ohtani, Takayuki; and Iizuka, Tetsuya, 4,594,519, Cl. 307-443.000.
Ikeda, Sakuji: *See—*
Kobayashi, Yukio; Shirakawa, Hideki; and Ikeda, Sakuji, 4,594,180, Cl. 252-500.000.
Ikeda, Tadaaki; Kitamura, Masakazu; and Okada, Tomoo, to Kabushiki Kaisha Saginomiya Seisakusho. Differential pressure valve. 4,593,535, Cl. 62-217.000.
Ikeda, Tadashi: *See—*
Sasaki, Noboru; Aida, Shunichi; and Ikeda, Tadashi, 4,594,317, Cl. 430-574.000.
Ikekawa, Nobuo: *See—*
DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, 4,594,192, Cl. 260-397.200.
Ikkanzaka, Isao: *See—*
Nakagawa, Mutuo; Ikkanzaka, Isao; and Uchida, Yasuyuki, 4,594,284, Cl. 428-234.000.

Imaizumi, Masahiro: *See*—
Nobusawa, Hiroshi; Hosoya, Eiji; Imaizumi, Masahiro; and Takasu, Hitoyuki, 4,593,782, Cl. 180-88.000.
Imaizumi, Masaru, to Minolta Camera Kabushiki Kaisha. Device for moving separating belt into or out of contact with photoconductive drum in electrophotographic copying machine. 4,593,993, Cl. 355-3.00R.
Imaki, Naoshi; and Nakanome, Takemi, to Mitsubishi Chemical Industries, Ltd. Process for preparing 2,2-dimethyl-2,3-dihydro-7-hydroxybenzofuran. 4,594,438, Cl. 549-462.000.
Imit, A.C.: *See*—
Vaqueiro, M. Cristina; and Reyes, Pedro, 4,594,260, Cl. 426-622.000.
Inagaki, Tom, to Hudson Wire Company. Method for manufacturing high strength copper alloy wire. 4,594,116, Cl. 148-12.70C.
Inagaki, Yoshio: *See*—
Fujita, Shinsaku; Koyama, Koichi; and Inagaki, Yoshio, 4,594,426, Cl. 548-217.000.
Inaguma, Yoshiharu: *See*—
Honaga, Susumu; Suzuki, Mikio; and Inaguma, Yoshiharu, 4,593,783, Cl. 180-141.000.
Inco Alloys International, Inc.: *See*—
Heck, Frank W.; Donachie, Stephen J.; and Merrick, Howard F., 4,594,222, Cl. 420-529.000.
Infanti, Vittorio. Collapsible combined rocker and chair. 4,593,950, Cl. 297-3.000.
Ingelmann, Hans-Joachim: *See*—
Humpolik, Bohumil; Ingelmann, Hans-Joachim; and Staffa, Karl-Heinz, 4,593,539, Cl. 62-504.000.
Innse Innocenti Santeustacchio S.p.A.: *See*—
Cattaneo, Filippo; and Perrone, Agostino, 4,593,807, Cl. 198-457.000.
Inoue, Kichiro: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Murase, Masao; Inoue, Kichiro; and Shirahase, Ichiro, 4,594,345, Cl. 514-234.000.
Inoue, Kimio, to Dow Chemical Company, The. The preparation of p-isopropenyl phenol and related compounds. 4,594,459, Cl. 568-781.000.
Inoue, Tatsuo; and Kimura, Mitsuru, to NEC Corporation. Substrate having at least one fine-wired conductive layer. 4,594,473, Cl. 174-68.500.
Inoue, Toshiaki: *See*—
Nagata, Masanori; Inoue, Toshiaki; and Hirayama, Mamoru, 4,594,663, Cl. 364-401.000.
Institut Pasteur: *See*—
Bizzini, Bernard, 4,594,336, Cl. 514-2.000.
Inter-Wood Maschinen GmbH & Co.: *See*—
Schaefer, Karl; Frank-Fahle, Gottfried; and Gasenzer, Norbert, 4,593,862, Cl. 241-88.000.
Interlake, Inc.: *See*—
Hagemann, Casper W., 4,593,847, Cl. 227-155.000.
International Business Machines Corporation: *See*—
Antonie, Charles H.; and Murray, Thomas K., III, 4,593,820, Cl. 209-573.000.
Barclay, Terry W.; Cielo, John R.; Martin, William J.; and Trushell, James B., 4,594,588, Cl. 340-771.000.
Barlow, John P., 4,594,677, Cl. 364-578.000.
Boulia, Dorothy I.; Pousson, Michael W., Jr.; Pring, Edward J.; and Stone, Nancy L., 4,594,674, Cl. 364-523.000.
Caruso, Mark B.; and Scranton, Robert A., 4,593,956, Cl. 384-1.000.
Doss, Saad K.; and Phipps, Peter B. P., 4,594,273, Cl. 427-443.100.
Drimak, Edward G., 4,594,682, Cl. 364-900.000.
George, Steven L.; and Hefner, James L., 4,594,679, Cl. 364-754.000.
Hao, Hsieh T.; Ling, Huei; Sachar, Howard E.; Weiss, Jeffrey; and Yamour, Yannis J., 4,594,655, Cl. 364-200.000.
Meyers, Richard F.; Rossi, Francis; and Strahle, Werner, 4,594,690, Cl. 365-230.000.
Moore, Victor S.; Veneski, Gerard A.; Parker, Tony E.; Rhodes, Joseph C., Jr.; Kraft, Wayne R.; and Stahl, William L., Jr., 4,594,661, Cl. 364-200.000.
Schick, Jerome D., 4,594,554, Cl. 328-268.000.
Wallis, Christopher N., 4,594,622, Cl. 360-77.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M.; and McGhie, Joseph A., 4,594,464, Cl. 568-592.000.
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,594,254, Cl. 426-535.000.
International Standard Electric Corporation: *See*—
Gurke, Reinhard; and Eichel, Manfred, 4,594,562, Cl. 330-307.000.
Rosl, Wolfgang, 4,594,483, Cl. 200-6.00B.
International Telephone and Telegraph Corporation: *See*—
West, Michael D., 4,593,882, Cl. 251-243.000.
Interthal, Werner; Durst, Franz-Josef; and Haas, Raimund, to Hoechst Aktiengesellschaft. High polymer solutions having an increased drag and process for their manufacture. 4,593,762, Cl. 166-275.000.
Ionescu, Alexandru D.: *See*—
Borcea, Nicky; and Ionescu, Alexandru D., 4,593,948, Cl. 294-88.000.
Ionics Incorporated: *See*—
Goldstein, Arthur L., 4,594,135, Cl. 204-180.100.
Iowa State University Research Foundation & Inc.: *See*—
Coats, Joel R., 4,594,360, Cl. 514-716.000.
Isacoff, Eric G.: *See*—
Chong, Berni P.; and Isacoff, Eric G., 4,594,158, Cl. 210-193.000.
Isaka, Kinichi: *See*—
Kawaguchi, Masashi; Isaka, Kinichi; Endo, Yoshihiro; and Kishishita, Hiroshi, 4,594,282, Cl. 428-216.000.
Isenring, Fritz. Impact device. 4,593,767, Cl. 173-98.000.
Ishida, Kozo; Okayama, Junji; and Otsuki, Kunio, to Horiba, Ltd. Continuous particulate-measuring apparatus using an optoacoustic effect. 4,594,004, Cl. 356-433.000.
Ishida, Takuzo, to Minnesota Mining and Manufacturing Company. Color thermal diffusion-transfer with leuco dye reducing agent. 4,594,307, Cl. 430-203.000.
Ishihara Sangyo Kaisha, Ltd.: *See*—
Honma, Ichiro; Hirai, Masaharu; Amano, Masatoshi; and Takumi, Nobusuke, 4,594,267, Cl. 427-127.000.
Ishihara, Shoichi: *See*—
Yoneno, Hiroshi; Matsuo, Yoshihiro; and Ishihara, Shoichi, 4,594,279, Cl. 428-69.000.
Ishihara, Takeo: *See*—
Yamamoto, Sadashi; and Ishihara, Takeo, 4,593,785, Cl. 180-291.000.
Ishii, Koji; and Maehara, Kenso, to Ryobi Ltd. Multi-position spring loaded timing cam for sheet release grippers. 4,593,619, Cl. 101-409.000.
Ishikawa, Hiroshi; Uno, Tetsuyuki; Miyamoto, Hisashi; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co. Limited. Pyrrolo [3,2,1-ij]-quinoline carboxylic acid compound. 4,594,347, Cl. 514-252.000.
Ishikawa, Kazuo: *See*—
Shinbori, Kenichi; and Ishikawa, Kazuo, 4,594,613, Cl. 358-213.000.
Ishikawa, Masaru: *See*—
Shiratori, Harunori; Ishikawa, Masaru; and Kato, Hisami, 4,593,931, Cl. 280-714.000.
Ishimaru, Hajime; Narushima, Katsuya; and Momose, Takashi, to Hajime Ishimaru. Ion pump. 4,594,054, Cl. 417-49.000.
Ishizaki, Kanjiro: *See*—
Suzuki, Osamu; Ishizaki, Kanjiro; and Ozawa, Seiichi, 4,594,513, Cl. 250-506.100.
Ishizuka, Ichiro: *See*—
Hagiwara, Satoru; Ishizuka, Ichiro; and Okabe, Kazuo, 4,594,203, Cl. 264-22.000.
Ishizuka, Yasuhiro; Nakayama, Takashi; and Yamagata, Seiichi, to Toray Industries, Inc. Method and apparatus for producing spun yarn. 4,593,522, Cl. 57-400.000.
Isobe, Kenichi: *See*—
Takahashi, Kozo; Tahaka, Yasuharu; Isobe, Kenichi; and Ichinohe, Shoji, 4,594,401, Cl. 526-279.000.
Isosys, Inc.: *See*—
Delfosse, Gilles C., 4,593,501, Cl. 52-167.000.
Isover Saint-Gobain: *See*—
Mosnier, Francis, 4,594,086, Cl. 65-4.400.
Isselstein, Fritz; Luhn, Ernst; Coen, Gunther; Oberhoff, Dietmar; and Keck, Roland, to Betriebsforschungsinstitut VDEH Institut for Angewandete Forschung GmbH. Electromagnet transducer. 4,593,567, Cl. 73-643.000.
Itikawa, Tadao: *See*—
Hayashi, Ikuo; Itikawa, Tadao; and Shimizu, Kiyoshi, 4,594,409, Cl. 528-328.000.
Ito, Akira; and Ueno, Toshishige, to Kureha Kagaku Kogyo Kabushiki Kaisha. Impregnating oil for a capacitor comprising two metallized plastic films and the capacitor impregnated with the oil. 4,594,642, Cl. 361-315.000.
Ito, Hayami: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.
Ito, Hiroshi: *See*—
Kawakyu, Yoshito; Higuchi, Toyoki; and Ito, Hiroshi, 4,594,528, Cl. 313-503.000.
Ito, Masazumi: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.
Ito, Toshio: *See*—
Ueguri, Shigeo; Tabata, Youichiro; Komura, Hirotsugu; and Ito, Toshio, 4,594,498, Cl. 219-137.0PS.
Itoh, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Robot control apparatus. 4,594,670, Cl. 364-513.000.
Itoh, Masaaki; Kogure, Hiroshi; Iino, Kenji; Ochiai, Izumi; Kitayama, Yukio; and Miyagi, Masahiro, to Hitachi, Ltd. Fin-and-tube type heat exchanger. 4,593,756, Cl. 165-151.000.
ITT Industries, Inc.: *See*—
Uhlenhoff, Arnold, 4,594,678, Cl. 364-736.000.
Iwagami, Fusao, to Sharp Kabushiki Kaisha. Printer head mounting assembly in an ink jet system printer. 4,594,598, Cl. 346-140.00R.
Iwaki, Yoshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Temperature protective circuit for a charging generator. 4,594,631, Cl. 361-20.000.
Iwasa, Hiroki: *See*—
Baba, Takeshi; Iwasa, Hiroki; and Ohmi, Kyozo, 4,593,953, Cl. 301-6.0CS.
Iwashita, Masao; and Tenma, Tsutomu, to Nippon Electric Co., Ltd. Data processing machine suitable for high-speed processing. 4,594,653, Cl. 364-200.000.
Iwata, Atsushi: *See*—
Kaneko, Takao; Yamauchi, Hironori; and Iwata, Atsushi, 4,594,687, Cl. 364-900.000.

Iwata, Fumio; Nakamura, Takato; and Sakata, Tadakazu, to UBE Industries, Ltd. 5-mercapto-1,2,3-thiadiazoles composition and process for preparing the same. 4,594,424, Cl. 548-127.000.

Izaki, Kansei: *See—*
Suzuki, Takashi; Kawakami, Takamasa; Koyama, Takeshi; Orisaku, Masami; Izaki, Kansei; Nakano, Rieko; and Mori, Akira, 4,594,330, Cl. 501-92.000.

J. I. Case Company: *See—*
Cornell, Charles R., 4,594,666, Cl. 364-424.100.

Jachno, Alex, to Bsr, Ltd. Wire matrix print head. 4,594,010, Cl. 400-124.000.

Jackson, Isaac S.: *See—*
Sheridan, David S.; and Jackson, Isaac S., 4,593,690, Cl. 128-207.150.

Jacoby, John E.: *See—*
Yu, Ho; Jacoby, John E.; and Ramser, Robert A., 4,593,745, Cl. 164-487.000.

Jaedicke, Hagen: *See—*
Schaefer-Luederssen, Ulrich; Jaedicke, Hagen; Paust, Joachim; and Eggersdorfer, Manfred, 4,594,456, Cl. 568-447.000.

Jakubowicz, Raymond F.; and MacDonald, Stuart G., to Eastman Kodak Company. Variable volume pipette. 4,593,837, Cl. 222-288.000.

James River Corporation: *See—*
Maroszek, Raymond V., 4,594,492, Cl. 219-10.55E.

James, Robert B., Jr.; and Carson, Don B., to UOP Inc. Process for making high octane gasoline. 4,594,144, Cl. 208-62.000.

Janes, Norman F.: *See—*
Elliott, Michael; Janes, Norman F.; Elliott, Richard L.; Khambay, Bhupinder P. S.; and Pulman, David A., 4,594,355, Cl. 514-521.000.

Japan Metals and Chemicals Co., Ltd.: *See—*
Saito, Yoshizi; Nakamura, Masaru; Iida, Toyoshi; and Honda, Tsugunori, 4,594,169, Cl. 252-8.50C.

Jarog, Dean J.: *See—*
Beauman, William H.; Jarog, Dean J.; and Micklin, Steven H., 4,594,361, Cl. 521-28.000.

Jaswa, Vijay C.; and Thomas, Charles E., to General Electric Company. Concurrent pro[illegible]sor for control. 4,594,651, Cl. 364-131.000.

Jaycox, Donald F.: *See—*
Scheithauer, Eric A.; and Jaycox, Donald F., 4,594,635, Cl. 361-119.000.

Jenkner, Wolfgang R.; Christie, Alan E.; Elsayed, Emad E. M.; Griffiths, John S.; and Mentes, Guney A. Offshore intake structure. 4,594,024, Cl. 405-127.000.

Jensen, John E., to Hughes Aircraft Company. Method for forming gallium arsenide from thin solid films of gallium-arsenic complexes. 4,594,264, Cl. 427-53.100.

Jeppson, Morris R., to MP Materials Corporation. Paving method and pavement construction for concentrating microwave heating within pavement material. 4,594,022, Cl. 404-28.000.

Jimco Products: *See—*
Bonnici, Charles; and Ballard, James W., 4,593,504, Cl. 52-199.000.

Johns Hopkins University, The: *See—*
Fischell, Robert E., 4,594,058, Cl. 417-413.000.

Johnson, Clarence W., to Bralorne Resources Limited. Wellhead sealing system. 4,593,914, Cl. 277-5.000.

Johnson, Leroy A. Asymmetrically accelerated vibrator for feeding materials. 4,593,603, Cl. 91-265.000.

Johnson, Robert E.: *See—*
McLerran, Carl M.; and Johnson, Robert E., 4,593,898, Cl. 272-73.000.

Johnson, Wallace. High nutrient content fertilizers. 4,594,090, Cl. 71-29.000.

Joly, Jean C., to AMP Incorporated. Electrical connector for mating with three orthogonally arranged tabs. 4,593,965, Cl. 339-192.00R.

Jones, Carol: *See—*
Gusella, James F.; Housman, David; Keys, Cheryl; Varsanyi-Breiner, Aviva; Puck, Theodore T.; Jones, Carol; and Kao, Fa-Ten, 4,594,318, Cl. 435-6.000.

Jones, Herbert, administrator: *See—*
Glamkowski, Edward J.; and Jones, Michael C., deceased, 4,594,435, Cl. 549-345.000.

Jones, Mary A., to Dow Chemical Company, The. Impact-modified monovinylidene aromatic polymer injection molding resins. 4,594,391, Cl. 525-316.000.

Jones, Michael C., deceased: *See—*
Glamkowski, Edward J.; and Jones, Michael C., deceased, 4,594,435, Cl. 549-345.000.

Jones, Richard P.: *See—*
Clark, Kevin E.; and Jones, Richard P., 4,593,476, Cl. 33-529.000.

Josefiak, Christoph; and Wechs, Friedbert, to Akzo NV. Method for the production of porous bodies with adjustable total pore volume, adjustable pore size and adjustable pore walls. 4,594,207, Cl. 264-41.000.

Joy, Ivan L. Ultrasonic transducer unit to locate cracks in rail base. 4,593,569, Cl. 75-636.000.

Junkosha Co. Ltd.: *See—*
Suzuki, Hirosuke; Kobayashi, Satoru; and Shimosawa, Katsuo, 4,594,638, Cl. 361-280.000.

Jwuc, Karl J.: *See—*
Hanula, Richard M.; and Jwuc, Karl J., 4,593,828, Cl. 213-62.00A.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Takeuchi, Hiroshi; Fukushima, Hirotaka; and Majima, Hidekazu, 4,593,801, Cl. 192-70.150.

Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Konishi, Satoshi; Kitagawa, Kazumi; and Utsunomiya, Michito, 4,593,778, Cl. 177-185.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Miyazawa, Hiroshi, 4,593,932, Cl. 280-765.100.

Kabushiki Kaisha Naka Gijutsu Kenkyusho: *See—*
Naka, Hiromitsu; Okushima, Takehiko; and Shoji, Tatsuo, 4,593,493, Cl. 49-248.000.

Kabushiki Kaisha Nihon Pisco: *See—*
Hama, Tomio; and Yamazaki, Kiyoyasu, 4,593,943, Cl. 285-308.000.

Kabushiki Kaisha Saginomiya Seisakusho: *See—*
Ikeda, Tadaaki; Kitamura, Masakazu; and Okada, Tomoo, 4,593,535, Cl. 62-217.000.

Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
Baba, Takeshi; Iwasa, Hiroki; and Ohmi, Kyozo, 4,593,953, Cl. 301-6.0CS.

Kabushiki Kaisha Toshiba: *See—*
Baba, Masaharu, 4,593,958, Cl. 339-17.00D.
Kobayashi, Hiroshi; Yasunaga, Toshio; Muro, Toshihiko; Takeda, Fumio; and Tsuruta, Yutaka, 4,593,499, Cl. 52-126.600.
Nakamoto, Yasunobu; Terayama, Toshiro; and Takayanagi, Mikio, 4,593,527, Cl. 60-660.000.
Tamura, Sakae; Hosoya, Masahiro; Matsuo, Takeshi; and Uehara, Tsutomu, 4,593,994, Cl. 355-3.0SC.

Kabushiki Kaisha Toyota Chou Kenkyusho: *See—*
Suzuki, Shoichi; Kurobe, Moriji; Araga, Toshima; and Hiruta, Osamu, 4,594,112, Cl. 148-6.14R.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Yamamoto, Minoru; and Sakata, Jiro, 4,594,079, Cl. 55-158.000.

Kaiser, Donald B.: *See—*
Henry, Dale V.; and Kaiser, Donald B., 4,594,494, Cl. 219-86.800.

Kaiser, Donald F.: *See—*
Frank, Lee F.; and Kaiser, Donald F., 4,594,614, Cl. 358-214.000.

Kaisha Toyota Jidosha Kabushiki: *See—*
Okamoto, Shuichi; Kunihiro, Motoo; and Nakajima, Zenji, 4,593,891, Cl. 267-140.100.

Kaji, Masayuki: *See—*
Mikawa, Isao; Endoh, Masahiro; Kaji, Masayuki; Kishida, Yoshitaka; and Yamamoto, Nobuhiro, 4,593,632, Cl. 111-3.000.

Kajino, Jiro: *See—*
Kanchiku, Hiroshi; Kajino, Jiro; and Saito, Fuminari, 4,594,624, Cl. 360-90.000.

Kajiwara, Hiroki: *See—*
Kikkawa, Seiichi; Ogata, Hisanao; Hakuraku, Yoshinori; Mase, Masahiro; Tsumaki, Nobuo; Awada, Yoshihisa; and Kajiwara, Hiroki, 4,593,835, Cl. 222-131.000.

Kaken Pharmaceutical Co., Ltd.: *See—*
Kawata, Terushige; and Yamashita, Shinsuke, 4,594,240, Cl. 424-28.000.

Kali-Chemie Pharma GmbH: *See—*
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,594,436, Cl. 549-359.000.

Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidensschink, Rudolf; and Romer, Michael, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the; and Merck Patent Gesellschaft mit beschrankter Haftung. Compounds containing a fluorobiphenylyl group. 4,594,465, Cl. 568-642.000.

Kamao, Mitsugu: *See—*
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.

Kameo, Kazuya: *See—*
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; Nakashima, Yoshimoto; and Sota, Kaoru, 4,594,197, Cl. 558-255.000.

Kaminski, Joan M.: *See—*
Horodysky, Andrew G.; and Kaminski, Joan M., 4,594,171, Cl. 252-49.600.

Kamono, Takashi; and Otsu, Akihiko, to AMP Incorporated. Method of making a contact assembly. 4,593,463, Cl. 29-884.000.

Kamyr AB: *See—*
Gullichsen, Johan, 4,594,152, Cl. 209-273.000.

Kanai Juyo Kogyo Co., Ltd.: *See—*
Nakagawa, Mutuo; Ikkanzaka, Isao; and Uchida, Yasuyuki, 4,594,284, Cl. 428-234.000.

Kanasugi, Mikiko: *See—*
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Gonda, Michihiro; Kanasugi, Mikiko; and Obara, Toshio, 4,594,601, Cl. 346-221.000.

Kanatani, Yoshiharu: *See—*
Ohba, Toshihiro; Kinoshita, Hiroshi; Kanatani, Yoshiharu; and Uede, Hisashi, 4,594,589, Cl. 340-805.000.

Kanchiku, Hiroshi; Kajino, Jiro; and Saito, Fuminari, to Matsushita Electric Industrial Co., Ltd. Magnetic tape recording and/or reproducing apparatus with variable capstan torque transmission means. 4,594,624, Cl. 360-90.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Muramatsu, Eiichi; Mathumoto, Sigemi; and Nagoshi, Fumiya, 4,594,387, Cl. 525-67.000.

Kaneko, Kyoichi: *See—*
Yasui, Kuniharu; and Kaneko, Kyoichi, 4,593,869, Cl. 242-220.000.

Kaneko, Takao; Yamauchi, Hironori; and Iwata, Atsushi, to Nippon Telegraph & Telephone Corporation. Address arithmetic circuit of a

memory unit utilized in a processing system of digitalized analogue signals. 4,594,687, Cl. 364-900.000.

Kaneko, Yutaka: *See—*
Kimura, Toshihiko; Sasaki, Takashi; and Kaneko, Yutaka, 4,594,314, Cl. 430-506.000.

Kaneta, Shigeyoshi: *See—*
Harano, Fumio; Kaneta, Shigeyoshi; Nakagaki, Kunihiro; and Nishiyama, Satoshi, 4,594,124, Cl. 156-468.000.

Kangyo Denkikiki Kabushiki Kaisha: *See—*
Sudo, Michio, 4,594,524, Cl. 310-68.00R.

Kankaanpaa, Pentti: *See—*
Kilpelainen, Harri; and Kankaanpaa, Pentti, 4,594,384, Cl. 524-705.000.

Kanzaki, Minoru; Komiya, Kazumi; Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, to Nippon Telegraph & Telephone Hitachi Ltd & Public Corporation. Signal processing system and the method. 4,594,733, Cl. 382-50.000.

Kao, Fa-Ten: *See—*
Gusella, James F.; Housman, David; Keys, Cheryl; Varsanyi-Breiner, Aviva; Puck, Theodore T.; Jones, Carol; and Kao, Fa-Ten, 4,594,318, Cl. 435-6.000.

Karg, Erwin: *See—*
Mordstein, Johann; and Karg, Erwin, 4,593,863, Cl. 241-92.000.

Karlsson, Jarding U.: *See—*
Moosberg, Borje; S.; and Karlsson, Jarding U., 4,593,866, Cl. 242-84.52B.

Kashiwakura, Koji: *See—*
Takahashi, Youichi; Kashiwakura, Koji; Morisawa, Junichiro; and Kobayashi, Masahiro, 4,594,497, Cl. 219-130.210.

Katagiri, Hidenori: *See—*
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,594,101, Cl. 75-0.50C.

Katayama, Keiichi: *See—*
Minegishi, Keiichi; Akiba, Tokuji; Katayama, Keiichi; and Machida, Hiroshi, 4,594,209, Cl. 264-66.000.
Moriya, Muneo; Takemasa, Toshihiro; and Katayama, Keiichi, 4,593,549, Cl. 72-12.000.

Kato, Hideaki: *See—*
Araki, Shigeru; and Kato, Hideaki, 4,594,526, Cl. 310-317.000.

Kato, Hisami: *See—*
Shiratori, Harunori; Ishikawa, Masaru; and Kato, Hisami, 4,593,931, Cl. 280-714.000.

Kato, Masaaki: *See—*
Omori, Toshihiko; Sakakibara, Shuzi; Kato, Masaaki; and Masuda, Akira, 4,593,664, Cl. 123-446.000.

Kato, Masanori: *See—*
Tanaka, Katsuyuki; Kimura, Yasuhiro; Kato, Masanori; and Kuwakado, Satosi, 4,594,694, Cl. 367-120.000.

Katsuki, Tsutomu; and Sharpless, Karl B., to Leland Stanford Jr. University, The Board of Trustees of the. Method for asymmetric epoxidation. 4,594,439, Cl. 549-523.000.

Katumata, Noriaki: *See—*
Haga, Katutoshi; Sasamori, Takehusa; Kurita, Teizi; and Katumata, Noriaki, 4,594,037, Cl. 409-144.000.

Kaustrater, Gert, to KUKA Wehrtechnik GmbH. Device for feeding shell ammunition within an armored vehicle. 4,593,600, Cl. 89-33.100.

Kavthekar, Keshav S. Machine for manufacturing universal joints. 4,593,444, Cl. 29-27.00C.

Kawabata, Nobuaki, to Nippon Oil Co., Ltd. Aqueous composition for the protection of paint surfaces. 4,594,109, Cl. 106-271.000.

Kawaguchi, Masashi; Isaka, Kinichi; Endo, Yoshihiro; and Kishishita, Hiroshi, to Sharp Kabushiki Kaisha. Layer structure of thin-film electroluminescent display panel. 4,594,282, Cl. 428-216.000.

Kawakami, Hideo; Tazawa, Shinichi; and Endo, Masami, to Toshiba Machine Co., Ltd. Polishing machine. 4,593,495, Cl. 51-118.000.

Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., to Union Carbide Corporation. Polycarbonates having improved hydrolytic stability. 4,594,404, Cl. 528-174.000.

Kawakami, Takamasa: *See—*
Suzuki, Takashi; Kawakami, Takamasa; Koyama, Takeshi; Orisaku, Masami; Izaki, Kansei; Nakano, Rieko; and Mori, Akira, 4,594,330, Cl. 501-92.000.

Kawakyu, Yoshito; Higuchi, Toyoki; and Ito, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Thin film electroluminescence device and method of manufacturing the same. 4,594,528, Cl. 313-503.000.

Kawamata, Syooichi: *See—*
Takahashi, Tadashi; Miyashita, Kunio; Kawamata, Syooichi; and Morinaga, Shigeki, 4,594,548, Cl. 324-208.000.

Kawano, Hikaru; Sato, Koji; and Nogi, Hiroyoshi, to Musashi Co., Ltd.; and Hitachi Denshi Engineering Kabushiki Kaisha. Banknote counting and bandsealing device. 4,594,043, Cl. 414-43.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.

Kawata, Terushige; and Yamashita, Shinsuke, to Teikoku Seiyaku Kabushiki Kaisha; Nippon Kayaku Kabushiki Kaisha; and Kaken Pharmaceutical Co., Ltd. Sheet-shape adhesive preparation. 4,594,240, Cl. 424-28.000.

Kawauchi, Toru, to Mitsubishi Jukogyo Kabushiki Kaisha. Clad material with unheated welding adhesion. 4,594,293, Cl. 428-548.000.

Keahey, Sammie G.; Keizer, Alan S.; and Lobb, Thomas T., to AMP Incorporated. Robotic harness maker. 4,593,452, Cl. 29-564.600.

Kearns, Peter J. M., to Burroughs Corporation. Conditionally self-copying stationery. 4,593,935, Cl. 282-28.00R.

Keck, Roland: *See—*
Isselstein, Fritz; Luhn, Ernst; Coen, Gunther; Oberhoff, Dietmar; and Keck, Roland, 4,593,567, Cl. 73-643.000.

Kees, Galen D. Sling shot gun structure. 4,593,673, Cl. 124-20.00B.

Kehl, Charles W. Waste compactor apparatus. 4,593,615, Cl. 100-227.000.

Keiper Recaro GmbH & Co.: *See—*
Berghof, Hans-Joachim, 4,593,952, Cl. 297-365.000.

Keisers, Laurenz: *See—*
Oberbach, Manfred; and Keisers, Laurenz, 4,593,838, Cl. 222-607.000.

Keizer, Alan S.: *See—*
Keahey, Sammie G.; Keizer, Alan S.; and Lobb, Thomas T., 4,593,452, Cl. 29-564.600.

Kelley, Douglas P., to Electric Power Research Institute, Inc. Rotary cutter for cable following apparatus. 4,593,772, Cl. 175-53.000.

Kelley, Stephen H.: *See—*
Merritt, John W.; Wurzburg, Henry; and Kelley, Stephen H., 4,594,707, Cl. 370-91.000.

Kelly, Edward; Bishop, Frederick T.; and Reilly, Donald J., to Recastco Inc. Ingot mould repair method. 4,593,747, Cl. 164-496.000.

Kempter, Fritz E.; Sabelus, Gunther; Schupp, Eberhard; and Weiss, Wolfram, to BASF Aktiengesellschaft. Preparation of amide-containing epoxide/amine adducts. 4,594,403, Cl. 528-113.000.

Kenmotsu, Isami: *See—*
Takahashi, Hideyuki; Kenmotsu, Isami; Okajima, Takahiro; and Takahashi, Yoshio, 4,594,700, Cl. 369-39.000.

Kepski, Roman; Walczak, Franciszek; Plucinski, Zbigniew; and Piatkowski, Adam, to Osrodek Badawczo-Rozwojowy Techniki Medycznej "Ormed". Measuring system for the electrical activity of the heart conducting system on the beat-to-beat basis by a noninvasive method. 4,593,702, Cl. 128-696.000.

Kerfoot, Derek E.: *See—*
Weir, Donald R.; Kerfoot, Derek E.; and Chalkley, Michael E., 4,594,102, Cl. 75-119.000.

Kernforschungszentrum Karlsruhe GmbH: *See—*
Kunze, Siegmar; Losch, Gunter; Dippel, Theodor; Laske, Dietrich; and Hubner, Walter, 4,594,186, Cl. 252-628.000.

Kesling, Haven S., Jr.; and Gillman, Hyman D., to Atlantic Richfield Company. Alkoxylated plasticizer alcohol ether sulfate surfactants. 4,594,185, Cl. 252-551.000.

Key Pharmaceuticals, Inc.: *See—*
Bodor, Nicholas, 4,594,356, Cl. 514-534.000.

Keys, Cheryl: *See—*
Gusella, James F.; Housman, David; Keys, Cheryl; Varsanyi-Breiner, Aviva; Puck, Theodore T.; Jones, Carol; and Kao, Fa-Ten, 4,594,318, Cl. 435-6.000.

Khambay, Bhupinder P. S.: *See—*
Elliott, Michael; Janes, Norman F.; Elliott, Richard L.; Khambay, Bhupinder P. S.; and Pulman, David A., 4,594,355, Cl. 514-521.000.

Khera, Muhammad I.: *See—*
Perry, Thomas J.; and Khera, Muhammad I., 4,594,712, Cl. 371-49.000.
Perry, Thomas J.; and Khera, Muhammad I., 4,594,713, Cl. 371-49.000.

Khuddus, Mo A.: *See—*
Russell, David B.; Gitlitz, Melvin H.; Leiner, Howard H.; Khuddus, Mo A.; and Berger, Abe, 4,594,365, Cl. 523-122.000.

Kikkawa, Seiichi; Ogata, Hisanao; Hakuraku, Yoshinori; Mase, Masahiro; Tsumaki, Nobuo; Awada, Yoshihisa; and Kajiwara, Hiroki, to Hitachi, Ltd. Cryogenic liquefied pump system. 4,593,835, Cl. 222-131.000.

Kikugawa, Shozo: *See—*
Okaniwa, Kenichiro; Kikugawa, Shozo; and Koyama, Mikio, 4,594,224, Cl. 422-56.000.

Kilger, Fridbert; Roth, Siegfried; Breithaupt, Rupert; Menke, Jupp; and Zeifang, Gunter, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Apparatus for stabilizing the scanning direction in an image field scanning device. 4,594,503, Cl. 250-203.00R.

Kilpelainen, Harri; and Kankaanpaa, Pentti, to Valtion Teknillinen Tutkimuskeskus. Adhesive composition particularly for manufacturing wood constructions, panels and other similar wood products. 4,594,384, Cl. 524-705.000.

Kimball, Christopher V.; and Marzetta, Thomas L., to Schlumberger Technology Corporation. Sonic well logging. 4,594,691, Cl. 367-32.000.

Kimball International, Inc.: *See—*
Slaats, Mathew A.; and Strange, Patrick E., 4,593,951, Cl. 297-347.000.
Stahnke, Wayne L., 4,593,592, Cl. 84-21.000.

Kimball, Jerome W. Apparatus for picking up objects randomly distributed on a surface. 4,593,519, Cl. 56-328.00R.

Kimberly-Clark Corporation: *See—*
Simon, Gene F., 4,593,418, Cl. 2-275.000.

Kimura, Kazuo; Mukai, Hiromu; and Shibuya, Taro, to Minolta Camera Kabushiki Kaisha. Viewfinder lens system. 4,593,984, Cl. 354-219.000.

Kimura, Minoru; and Endo, Michitada, to Mitsubishi Denki Kabushiki Kaisha. Evaporation-cooled gas insulated electrical apparatus. 4,593,532, Cl. 62-119.000.

Kimura, Mitsuru: *See—*
Inoue, Tatsuo; and Kimura, Mitsuru, 4,594,473, Cl. 174-68.500.

Kimura, Toshihiko; Sasaki, Takashi; and Kaneko, Yutaka, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic light-sensitive material. 4,594,314, Cl. 430-506.000.

Kimura, Yasuhiro: *See*—
Tanaka, Katsuyuki; Kimura, Yasuhiro; Kato, Masanori; and Kuwakado, Satosi, 4,594,694, Cl. 367-120.000.

Kinbara, Yoshihide, to Mitsubishi Denki Kabushiki Kaisha. Inverter device. 4,594,650, Cl. 363-58.000.

Kinoda, Seiji: *See*—
Tomisawa, Yoshiaki; Kinoda, Seiji; Fujita, Eiji; Murata, Masanori; Takeuchi, Toshio; and Ogawa, Ken, 4,593,986, Cl. 354-324.000.

Kinoshita, Hiroshi: *See*—
Ohba, Toshihiro; Kinoshita, Hiroshi; Kanatani, Yoshiharu; and Uede, Hisashi, 4,594,589, Cl. 340-805.000.

Kinoshita, Satoshi, to Nissan Motor Company, Limited; and Fuji Kiko Company, Limited. Automotive steering column tilt adjusting device. 4,593,577, Cl. 74-493.000.

Kinsey, Graeme R.; and Riesenberg, William M., to Zehntel, Inc. Apparatus for guiding a circuit board onto a testing location on a test fixture. 4,593,804, Cl. 193-41.000.

Kinumoto, Namio: *See*—
Yamamoto, Mitsuo; Kinumoto, Namio; Tsuji, Toshinori; and Hiraoka, Tutomu, 4,593,722, Cl. 138-145.000.

Kioritz Corporation: *See*—
Hiraizumi, Junichi, 4,594,083, Cl. 55-385.0BR.

Kircher, Klaus: *See*—
Krishnan, Sivaram; Kircher, Klaus; and Kress, Hans-Jurgen, 4,594,375, Cl. 524-89.000.

Kirwin, Ross C., to Calgon Corporation. Method for the control of dust using methacrylate containing emulsions and compositions. 4,594,268, Cl. 427-136.000.

Kishi, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control method for multicylinder internal combustion engines. 4,593,665, Cl. 123-478.000.

Kishida, Yoshitaka: *See*—
Mikawa, Isao; Endoh, Masahiro; Kaji, Masayuki; Kishida, Yoshitaka; and Yamamoto, Nobuhiro, 4,593,632, Cl. 111-3.000.

Kishishita, Hiroshi: *See*—
Kawaguchi, Masashi; Isaka, Kinichi; Endo, Yoshihiro; and Kishishita, Hiroshi, 4,594,282, Cl. 428-216.000.

Kissel, Ralph R.: *See*—
Currie, James R.; and Kissel, Ralph R., 4,594,540, Cl. 318-661.000.

Kitagawa, Isao, to Osaka Chemical Laboratory Co., Ltd. Method of isolating soyasaponins. 4,594,412, Cl. 536-18.500.

Kitagawa, Kazumi: *See*—
Konishi, Satoshi; Kitagawa, Kazumi; and Utsunomiya, Michito, 4,593,778, Cl. 177-185.000.

Kitaguchi, Tadashi: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,594,446, Cl. 560-168.000.

Kitamura, Masakazu: *See*—
Ikeda, Tadaaki; Kitamura, Masakazu; and Okada, Tomoo, 4,593,535, Cl. 62-217.000.

Kitayama, Yukio: *See*—
Itoh, Masaaki; Kogure, Hiroshi; Iino, Kenji; Ochiai, Izumi; Kitayama, Yukio; and Miyagi, Masahiro, 4,593,756, Cl. 165-151.000.

Kiyoshi, Terauchi, to Sanden Corporation. Scroll type compressor having reinforced spiral elements. 4,594,061, Cl. 418-55.000.

Klaissle, Siegfried: *See*—
Peetz, Wolfgang; Klaissle, Siegfried; Moser, Bernhard; and Muller, Norbert, 4,594,033, Cl. 408-156.000.

Klatt, Alfred; and Brinkmann, Karlheinz, to WABCO Fahrzeugbremsen GmbH. Gear positioning cylinder. 4,593,606, Cl. 92-52.000.

Klee, Harvey J., to United States of America, Navy. Combination frangible nose cap EMI shield. 4,593,637, Cl. 114-20.00R.

Klein, Hans-Rudolf: *See*—
Stauss, Eberhard; Klein, Hans-Rudolf; and Thalmeir, Alfons, 4,593,498, Cl. 52-18.000.

Klein, Roy S.: *See*—
Yeaney, Gerald L.; and Klein, Roy S., 4,593,822, Cl. 211-41.000.

Klenk, Ludwig; and Heyse, Klaus, to Hoechst Aktiengesellschaft. Tubular packaging casing. 4,593,721, Cl. 138-118.100.

Klievoneit, Harold R.; and Esposito, Augustine G., to St. Florian Company. Cassette for loading discs in a grinding/polishing apparatus. 4,593,496, Cl. 51-118.000.

Kneifel, Stephen E.: *See*—
Wunderlich, Max A., Jr.; and Kneifel, Stephen E., 4,594,205, Cl. 264-31.000.

Knodler, Helmut: *See*—
Lang, Armin; and Knodler, Helmut, 4,593,718, Cl. 137-596.000.

Knollenberg, Robert G., to Particle Measuring Systems, Inc. Laser with stabilized external passive cavity. 4,594,715, Cl. 372-32.000.

Knorreck, Peter; and Kramer, Manfred, to Robert Bosch GmbH. Electrical plug and socket connection. 4,593,962, Cl. 339-94.00M.

Kobayashi, Hiroshi; Yasunaga, Toshio; Muro, Toshihiko; Takeda, Fumio; and Tsuruta, Yutaka, to Kabushiki Kaisha Toshiba; and Taisei Corporation. Interior panel. 4,593,499, Cl. 52-126.600.

Kobayashi, Hiroshi: *See*—
Yahata, Haruki; and Kobayashi, Hiroshi, 4,594,705, Cl. 370-67.000.

Kobayashi, Ichiro: *See*—
Satoh, Susumu; Kobayashi, Ichiro; Takakura, Yumiko; and Tamada, Mitsuru, 4,594,243, Cl. 424-78.000.

Kobayashi, Kazutomo, to NEC Corporation. Packet communication systems. 4,594,706, Cl. 370-89.000.

Kobayashi, Kenji; Yasuda, Tsutomu; Matsumoto, Hiroshi; and Sone, Humiki, to Hitachi Cable, Ltd. Catheter-tip micromanometer utilizing single polarization optical fiber. 4,593,701, Cl. 128-667.000.

Kobayashi, Kenji: *See*—
Yamada, Osamu; Yanagi, Mikio; Futatsuya, Fumio; and Kobayashi, Kenji, 4,594,099, Cl. 71-96.000.

Kobayashi, Kouji: *See*—
Noguchi, Kiyoshi; Kobayashi, Kouji; and Takayama, Suguru, 4,594,296, Cl. 428-610.000.

Kobayashi, Masahiro: *See*—
Takahashi, Youichi; Kashiwakura, Koji; Morisawa, Junichiro; and Kobayashi, Masahiro, 4,594,497, Cl. 219-130.210.

Kobayashi, Masakazu: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,594,446, Cl. 560-168.000.

Kobayashi, Nobuo; and Tanahashi, Haruhiko, to Toyota Jidosha Kabushiki Kaisha. Rack and pinion type steering gear device. 4,593,578, Cl. 74-498.000.

Kobayashi, Satoru: *See*—
Suzuki, Hirosuke; Kobayashi, Satoru; and Shimosawa, Katsuo, 4,594,638, Cl. 361-280.000.

Kobayashi, Toshiaki; Terasawa, Shizuo; Akazome, Giichi; and Murai, Koichi, to New Japan Chemical Co., Ltd. Foam fire-extinguishing composition. 4,594,167, Cl. 252-3.000.

Kobayashi, Yoshiro: *See*—
DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, 4,594,192, Cl. 260-397.200.

Kobayashi, Yukio; Shirakawa, Hideki; and Ikeda, Sakuji, to Showa Denko K.K. Process for producing electrically conductive high polymer of acetylene. 4,594,180, Cl. 252-500.000.

Kochevar, Rudolph J. Weighted arrowhead and method. 4,593,913, Cl. 273-420.000.

Kochi, Hiromu: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,594,446, Cl. 560-168.000.

Kocur, Jean: *See*—
Bauer, Klaus; Bieringer, Hermann; Burstell, Helmut; and Kocur, Jean, 4,594,098, Cl. 71-86.000.

Kocur, Michael A.: *See*—
Reimschuessel, Herbert K.; and Kocur, Michael A., 4,594,452, Cl. 564-292.000.

Koenuma, Sukeo, to Citizen Watch Co., Ltd. Watch band. 4,593,842, Cl. 224-179.000.

Kogure, Hiroshi: *See*—
Itoh, Masaaki; Kogure, Hiroshi; Iino, Kenji; Ochiai, Izumi; Kitayama, Yukio; and Miyagi, Masahiro, 4,593,756, Cl. 165-151.000.

Kohler, Wolfgang: *See*—
Schneider, Egon; and Kohler, Wolfgang, 4,593,653, Cl. 122-365.000.

Kohli, Dalip K., to American Cyanamid Company. Curable epoxy resin compositions. 4,594,373, Cl. 523-400.000.

Koide, Yukio: *See*—
Yoshida, Takato; Haraguchi, Soichi; Hongo, Teruaki; and Koide, Yukio, 4,594,245, Cl. 424-101.000.

Koizumi, Kiyohide: *See*—
Sugimoto, Koichi; Koizumi, Kiyohide; Hamada, Toyohide; and Arai, Shinichi, 4,594,671, Cl. 364-513.000.

Kojima, Shigeru: *See*—
Ueda, Akiyoshi; Nagasaki, Fumihiko; Takakura, Yutaka; and Kojima, Shigeru, 4,594,429, Cl. 548-530.000.

Kollberg, Sten: *See*—
Folgero, Kare; and Kollberg, Sten, 4,594,723, Cl. 373-142.000.

Kollmeyer, Willy D., to Shell Oil Company. Oxacycloalkane-alpha-(thio)carboxylic acid derivatives and use as plant growth regulators and herbicides. 4,594,094, Cl. 71-88.000.

Kollmorgen Technologies Corporation: *See*—
Frisch, David C.; and Weber, Wilhelm, 4,594,311, Cl. 430-315.000.

Komiya, Kazumi: *See*—
Kanzaki, Minoru; Komiya, Kazumi; Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, 4,594,733, Cl. 382-50.000.

Komiya, Yutaka: *See*—
Adachi, Hideki; Tomosada, Masahiro; Hirose, Masayuki; Miyata, Masanori; and Komiya, Yutaka, 4,593,999, Cl. 355-55.000.

Komornicki, Jacques: *See*—
Delourme, Raymond; Detienne, Jean-Louis; Komornicki, Jacques; and Tellier, Jacques, 4,594,151, Cl. 209-166.000.

Komura, Akihiko: *See*—
Saito, Tetsuro; and Komura, Akihiko, 4,594,482, Cl. 200-5.00A.

Komura, Hirotsugu: *See*—
Ueguri, Shigeo; Tabata, Youichiro; Komura, Hirotsugu; and Ito, Toshio, 4,594,498, Cl. 219-137.0PS.

Kondo, Hirokazu; and Maruyama, Asao, to Tsubakimoto Chain Co. Apparatus for rotating and driving horizontal rack-type conveyors. 4,593,808, Cl. 198-570.000.

Konig, Klaus: *See*—
Findeisen, Kurt; Konig, Klaus; Fauss, Rudolf; and Heitkamper, Peter, 4,594,441, Cl. 560-25.000.

Konishi, Satoshi; Kitagawa, Kazumi; and Utsunomiya, Michito, to Kabushiki Kaisha Ishida Koki Seisakusho. Weighing machine with dummy load cell for error correction. 4,593,778, Cl. 177-185.000.

Konishiroku Photo Industry Co., Inc.: *See*—
Takahashi, Yoshiharu; and Suzuki, Kijiro, 4,593,987, Cl. 354-402.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Arai, Kazumi; Koyama, Mikio; and Okaniwa, Kenichiro, 4,594,225, Cl. 422-56.000.
Kimura, Toshihiko; Sasaki, Takashi; and Kaneko, Yutaka, 4,594,314, Cl. 430-506.000.
Okaniwa, Kenichiro; Kikugawa, Shozo; and Koyama, Mikio, 4,594,224, Cl. 422-56.000.
Shibue, Toshiaki; and Nagayasu, Koichi, 4,594,315, Cl. 430-531.000.

Koppe, Herbert; Abele, Wolfgang, deceased (by Schlussas-Abele, Heiderose, legal representative); Esser, Franz; Gaida, Wolfram; and Hoefke, Wolfgang, to Boehringer Ingelheim KG. 1-aryloxy-propanolamines. 4,594,344, Cl. 514-222.000.

Korper, George W., to Wite-Out Products, Inc. Fountain brush. 4,594,014, Cl. 401-115.000.

Koslowski, Georg. Adjustable stair guide and support. 4,593,503, Cl. 52-188.000.

Kosuge, Tokuo: *See*—
Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Osamu; and Hasegawa, Taiji, 4,593,663, Cl. 123-440.000.

Kotchev, Hristo B.: *See*—
Natov, Miltcho A.; Vassileva, Stefanka V.; Kotchev, Hristo B.; Djagarov, Zvetan S.; and Popov, Nikola N., 4,594,372, Cl. 523-208.000.

Kotter, Michael: *See*—
Hoelderich, Wolfgang; Riekert, Lothar; Kotter, Michael; and Hammon, Ulrich, 4,594,332, Cl. 502-64.000.

Kouroupis, John; and Chino, John J., to United States of America, Army. Temperature controlled adjusting mechanism. 4,593,626, Cl. 108-4.000.

Kowalski, Alexander: *See*—
Blankenship, Robert M.; and Kowalski, Alexander, 4,594,363, Cl. 521-64.000.

Koyama, Koichi: *See*—
Fujita, Shinsaku; Koyama, Koichi; and Inagaki, Yoshio, 4,594,426, Cl. 548-217.000.

Koyama, Mikio: *See*—
Arai, Kazumi; Koyama, Mikio; and Okaniwa, Kenichiro, 4,594,225, Cl. 422-56.000.
Okaniwa, Kenichiro; Kikugawa, Shozo; and Koyama, Mikio, 4,594,224, Cl. 422-56.000.

Koyama, Takeshi: *See*—
Suzuki, Takashi; Kawakami, Takamasa; Koyama, Takeshi; Orisaku, Masami; Izaki, Kansei; Nakano, Rieko; and Mori, Akira, 4,594,330, Cl. 501-92.000.

Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Information reproducing apparatus. 4,594,618, Cl. 360-73.000.

Kraft, Wayne R.: *See*—
Moore, Victor S.; Veneski, Gerard A.; Parker, Tony E.; Rhodes, Joseph C., Jr.; Kraft, Wayne R.; and Stahl, William L., Jr., 4,594,661, Cl. 364-200.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Heitmann, Hans-Gunter; and Rupp, Gunter, 4,594,160, Cl. 210-222.000.
Schneider, Egon; and Kohler, Wolfgang, 4,593,653, Cl. 122-365.000.

Krahmer, Hansjorg: *See*—
Skotsch, Carlo; Baumert, Dietrich; and Krahmer, Hansjorg, 4,594,095, Cl. 71-92.000.

Kramb, Jan, to Kramb Mothermik KG. Process for the cleaning of heat exchangers for exhaust gases from engines. 4,593,748, Cl. 165-1.000.

Kramb Mothermik KG: *See*—
Kramb, Jan, 4,593,748, Cl. 165-1.000.

Kramer, Manfred: *See*—
Knorreck, Peter; and Kramer, Manfred, 4,593,962, Cl. 339-94.00M.

Kramer, William M., to RCA Corporation. Imaging device having enhanced quantum efficiency. 4,594,605, Cl. 357-31.000.

Kraus, Reinhold: *See*—
Dell, Hans-Dieter; Pelster, Bernhard; Kraus, Reinhold; and Schierstedt, Detlef, 4,594,357, Cl. 514-537.000.

Kreil, Curtis L.; and Sidney, LuAnn, to Minnesota Mining and Manufacturing Company. Electron beam adhesion-promoting treatment of polyester film base. 4,594,262, Cl. 427-44.000.

Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Vinyl ether monomers derived from alkyl perfluoro-ω-(2-iodoethoxy) compounds. 4,594,458, Cl. 568-615.000.

Kress, Hans-Jurgen: *See*—
Krishnan, Sivaram; Kircher, Klaus; and Kress, Hans-Jurgen, 4,594,375, Cl. 524-89.000.

Kricka, Larry J.: *See*—
Whitehead, Thomas P.; Thorpe, Gary H. G. H.; Kricka, Larry J.; Gibbons, John E. C.; and Bunce, Roger A., 4,593,728, Cl. 141-98.000.

Krishnan, Sivaram; Kircher, Klaus; and Kress, Hans-Jurgen, to Bayer Aktiengesellschaft. Bis-(imide-sulfonate) flameproofing agents, their preparation and their use for flameproofing in polycarbonate. 4,594,375, Cl. 524-89.000.

Krivec, Eduard; and Gradenegger, Helmut, to Voest-Alpine Aktiengesellschaft. Conveying means for removing a heap of debris. 4,594,047, Cl. 414-565.000.

Krizman, Andrew J. Rake head for a raking implement. 4,593,520, Cl. 56-400.060.

Krohling, Erich, to Still GmbH. Combination internal combustion and electrical drive vehicles. 4,593,779, Cl. 180-65.400.

Kroll, Walter; and Christian, Paul, to Kroll, Walter. Gas scrubber. 4,594,081, Cl. 55-222.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Eder, Erich, 4,594,123, Cl. 156-456.000.

Krufka, Frank S., to RCA Corporation. System and method for measuring the area and dimensions of apertures in an opaque medium. 4,594,684, Cl. 364-900.000.

Krutchen, Charles M.; and Wu, Wen-Pao, to Mobil Oil Corporation. Polymer foam, thermoformed shapes thereof and methods of forming same. 4,594,208, Cl. 264-53.000.

Krutz, Gary W.; and Evans, Mark, to Krutz, Gary W. Speed and torque sensor for hydraulic motor. 4,593,555, Cl. 73-116.000.

Kub, Francis J., to Westinghouse Electric Corp. Charge coupled device with structures for forward scuppering to reduce noise. 4,594,604, Cl. 357-24.000.

Kubo, Masahiko, to Mita Industrial Co., Ltd. Developing process for two-colored electrophotography. 4,594,302, Cl. 430-42.000.

Kubokawa, Hiroaki, to Olympus Optical Co., Ltd. Endoscope. 4,593,680, Cl. 128-4.000.

Kubono, Shunji; and Anayama, Ushio, to Fuji Photo Film Co., Ltd. Reader-printer. 4,593,996, Cl. 355-5.000.

Kubrak, Dennis M.: *See*—
Musser, John H.; and Kubrak, Dennis M., 4,594,425, Cl. 548-161.000.

Kudlacek, Donald S. Compound archery bow. 4,593,674, Cl. 124-23.00R.

Kudo, Kiyoshi: *See*—
Sakamoto, Osamu; Tsuruta, Yasuhiko; Sasaki, Haruo; Tsukamoto, Yasuo; and Kudo, Kiyoshi, 4,594,005, Cl. 366-177.000.

Kugler, Edwin L.: *See*—
Fiato, Rocco A.; and Kugler, Edwin L., 4,594,331, Cl. 502-34.000.

Kuhn, Howard A.: *See*—
Otto, William L., Jr.; Lawson, Neal L.; and Kuhn, Howard A., 4,593,551, Cl. 72-240.000.

Kuhn, John J., to PPG Industries, Inc. Three-terminal controller for fiber glass bushing. 4,594,087, Cl. 65-1.000.

Kuhn, Karl O.: *See*—
Salesky, William J.; Ecer, Gunes M.; and Kuhn, Karl O., 4,593,776, Cl. 175-375.000.

Kuhn, Patrick C.: *See*—
Eriksson, Andrew J.; and Kuhn, Patrick C., 4,594,543, Cl. 324-72.000.

Kuhnert, Siegfried: *See*—
Hoft, Peter; Peter, Wolfgang; Hacke, Heinz; Luhr, Jurgen; Bergsteiner, Johann; Drobe, Wolfgang; Engelke, Fritz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,593,834, Cl. 220-273.000.

Kuisma, Heikki T., to Vaisala Oy. Capacitive pressure detector. 4,594,639, Cl. 361-283.000.

KUKA Wehrtechnik GmbH: *See*—
Kaustrater, Gert, 4,593,600, Cl. 89-33.100.

Kunihiro, Motoo: *See*—
Okamoto, Shuichi; Kunihiro, Motoo; and Nakajima, Zenji, 4,593,891, Cl. 267-140.100.

Kunze, Siegmar; Losch, Gunter; Dippel, Theodor; Laske, Dietrich; and Hubner, Walter, to Kernforschungszentrum Karlsruhe GmbH. Method for improving the radionuclide retention properties of solidified radioactive wastes. 4,594,186, Cl. 252-628.000.

Kurafuzi, Takamasa, to Tokyo Shibaura Denki Kabushiki Kaisha. Tape recorder. 4,594,625, Cl. 360-96.300.

Kuraray Co., Ltd.: *See*—
Ohigashi, Toshihide, 4,594,283, Cl. 428-218.000.

Kuraray Yuka Co., Ltd.: *See*—
Takuma, Toshiaki; Tsumura, Takayuki; Tsugiya, Takanori; Murakami, Katsuya; and Nakajima, Yasue, 4,594,449, Cl. 562-416.000.

Kurata, Motoharu, to Asahi Glass Co. Ltd. Method of manufacturing glass. 4,594,089, Cl. 65-135.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Ito, Akira; and Ueno, Toshishige, 4,594,642, Cl. 361-315.000.

Kurita, Teizi: *See*—
Haga, Katutoshi; Sasamori, Takehusa; Kurita, Teizi; and Katumata, Noriaki, 4,594,037, Cl. 409-144.000.

Kurobe, Moriji: *See*—
Suzuki, Shoichi; Kurobe, Moriji; Araga, Toshima; and Hiruta, Osamu, 4,594,112, Cl. 148-6.14R.

Kurth, Hermann: *See*—
Claar, Klaus; Heimbrodt, Klaus-Juergen; and Kurth, Hermann, 4,593,544, Cl. 70-264.000.

Kussendrager, Klaas D.; and Andreae, Anton C., to DMA-Campina B.V. Process for preparing lactose products. 4,594,110, Cl. 127-31.000.

Kuwabara, Takashi: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.

Kuwakado, Satosi: *See*—
Tanaka, Katsuyuki; Kimura, Yasuhiro; Kato, Masanori; and Kuwakado, Satosi, 4,594,694, Cl. 367-120.000.

Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, to Ciba-Geigy Corporation. Thioxanthonecarboxylic acids, esters thioesters and amides with reactive functional groups and polymers prepared therefrom and having thioxanthone radicals as side chains. 4,594,400, Cl. 526-256.000.

Kyle, James C. Hermetically sealed insulating assembly. 4,593,758, Cl. 166-65.100.

La Metal Deploye: *See*—
Coyon, Claude; and Bernet, Bernard, 4,594,280, Cl. 428-135.000.

Labsystems Oy: *See*—
Laine, Ensio; and Haapaniemi, Jarkko, 4,593,563, Cl. 73-432.00R.

Lacey, David: *See*—
Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidensschink, Rudolf; and Romer, Michael, 4,594,465, Cl. 568-642.000.

Lackey, Robert W.: *See*—
Fershko, Jane S.; and Lackey, Robert W., 4,593,823, Cl. 211-49.100.

Lacoude, Michel; Luansi, Michel; and Munier, Philippe, to Ugine Aciers. Process for the manufacture of rods or machine wire of martensitic stainless steel and the products which are produced. 4,594,115, Cl. 148-12.00B.

Lafuente, Claude A.: *See*—
Clement, Jean-Joseph; and Lafuente, Claude A., 4,593,971, Cl. 350-96.200.

Lagrue, Jean-Pierre: *See*—
Lefevre, Remi; and Lagrue, Jean-Pierre, 4,593,666, Cl. 123-480.000.

Laie, Ching H. Safety hauling coupler. 4,593,925, Cl. 280-493.000.

Laine, Ensio; and Haapaniemi, Jarkko, to Labsystems Oy. Procedure for determining velocity of dissolution. 4,593,563, Cl. 73-432.00R.

Lakeside Equipment Corporation: *See*—
Grujanac, Peter; and Huntington, Clyde, 4,594,156, Cl. 210-145.000.

Lal, Joginder; and Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Blends of higher α- olefin polymers and 1,2-epoxide polymers. 4,594,389, Cl. 525-187.000.

Lambert, Joseph M., Jr.; and Paspek, Stephen C., Jr., to Standard Oil Company, The. Mixing apparatus. 4,594,228, Cl. 422-218.000.

Lamont, Mary J.: *See*—
Nelson, Donald L.; and Lamont, Mary J., 4,594,398, Cl. 525-531.000.

Lancaster, William G., to Lantech, Inc. Flexible wrapping apparatus. 4,593,518, Cl. 53-556.000.

Landgraf, Gunter: *See*—
Wild, Wolfgang; and Landgraf, Gunter, 4,594,107, Cl. 106-1.130.

Lane, Richard L.; and Fanale, Donald J., to General Signal Corporation. Method and apparatus for growing crystals. 4,594,127, Cl. 156-617.00R.

Lang, Armin; and Knodler, Helmut, to Zahnradfabrik Friedrichshafen, AG. Pressure agent control arrangement for auxiliary power steering mechanisms. 4,593,718, Cl. 137-596.000.

Lange, Roland, to Underwater Design Technology Inc. Pack cart. 4,593,841, Cl. 224-153.000.

Langenbach, George: *See*—
Langenbach, George F., Jr., 4,593,694, Cl. 128-354.000.

Langenbach, George F., Jr., to Langenbach, George. Tweezers. 4,593,694, Cl. 128-354.000.

Langenbeck, Keith A. Container for storing and transporting letter mail and other flat articles. 4,593,816, Cl. 206-425.000.

Langlois, Jacques A. E.; and Liebetraut, Klaus A., to U.S. Philips Corporation. Drive control apparatus for an injection-molding machine. 4,594,065, Cl. 425-150.000.

Langos, Peter, to Mauser-Werke GmbH. Mold closing device. 4,594,067, Cl. 425-451.900.

Lankard, David R.; and Shoop, James D., to Diebold, Incorporated. Burglary attack resistant money safe high fiber concrete reinforced metal encased wall and door construction and manufacture. 4,593,627, Cl. 109-83.000.

Lantech, Inc.: *See*—
Lancaster, William G., 4,593,518, Cl. 53-556.000.

Lantz, Andre ; Mathais, Henri; and Dupuis, Gerard. Surface demoisturizing composition and use thereof. 4,594,177, Cl. 252-194.000.

LaRos Equipment Company, Inc.: *See*—
Brule, Paul L., 4,593,821, Cl. 209-620.000.

Larsson, Goran; and Sundman, Peter, to Riggarna Sundman, Larsson & Josefsson AB. Turnbuckle. 4,594,018, Cl. 403-43.000.

Laske, Dietrich: *See*—
Kunze, Siegmar; Losch, Gunter; Dippel, Theodor; Laske, Dietrich; and Hubner, Walter, 4,594,186, Cl. 252-628.000.

Lastra, Jorge E.: *See*—
Chandra, Rangasami S.; Quen, Stephen G.; Eineichner, Donald E.; and Lastra, Jorge E., 4,594,665, Cl. 364-422.000.

Latchways Limited: *See*—
Tupper, Alan W., 4,593,447, Cl. 29-241.000.

Latini, Tullio: *See*—
Maleci, Guglielmo; and Latini, Tullio, 4,594,019, Cl. 403-246.000.

Lattuada, Charles P., to Granite Technological Enterprises, Inc. Animal cage and method. 4,593,650, Cl. 119-15.000.

Lauer, Cornelius: *See*—
Oblizajek, Kenneth L.; Lauer, Cornelius; and Culp, Eugene H., 4,593,557, Cl. 73-146.000.

Laulhe, Rene ; and Garrigues, Jean-Claude, to Applications Mecaniques et Robinetterie Industrielle (A.M.R.I.). Sealing device providing the upstream/downstream sealing of a valve. 4,593,916, Cl. 277-12.000.

Launie, Kenneth J.; and Whiteside, George D., to Polaroid Corporation. Photographic apparatus having a film cassette counter. 4,593,983, Cl. 354-217.000.

Lautenschlaeger, Friedrich K., to Canadian Patents and Development Limited. Extraction of fruit, vegetable and meat products with a polyether-based polymer. 4,594,250, Cl. 426-257.000.

L'Avebene: *See*—
Dupin, Jean-Louis, 4,594,168, Cl. 252-8.50C.

Lavens, Patrick A.: *See*—
Sorgeloos, Patrick P.; Versichele, Danny H.; Leger, Philippe P. J. M.; and Lavens, Patrick A., 4,593,647, Cl. 119-2.000.

Lavery, Donald S.: *See*—
Brown, Chris W.; Maris, Mark A.; Lavery, Donald S.; Caputo, Bernard; and Model, Mark, 4,594,510, Cl. 250-339.000.

Lawson, Neal L.: *See*—
Otto, William L., Jr.; Lawson, Neal L.; and Kuhn, Howard A., 4,593,551, Cl. 72-240.000.

Lea, Bernard A.: *See*—
Sabongi, Gebran J.; Poon, Stephen S. C.; and Lea, Bernard A., 4,594,312, Cl. 430-339.000.

Lebensfeld, Steven, to H-G Toys, Inc. Toy vehicle with stamp. 4,593,618, Cl. 101-375.000.

Leblanc, Yvon N.; Zemelman, Valery B.; and Burgess, Gary L., to General Foods Corporation. Product and process using colloidal particles for producing an agglomerated instant coffee having a roast and ground appearance. 4,594,257, Cl. 426-594.000.

Leblanc, Yvon N.: *See*—
Zemelman, Valery B.; Burgess, Gary L.; Vitti, Rudolf A.; Forman, Todd M.; Batchelor, Anthony M.; and Leblanc, Yvon N., 4,594,256, Cl. 426-594.000.

Leboutet, Hubert: *See*—
Aucouturier, Jeanne; and Leboutet, Hubert, 4,594,530, Cl. 315-5.410.

Leclaire, Charly, to Prouvost S.A. Process for at least partly automating sewing operations and sewing machine therefor. 4,593,633, Cl. 112-121.110.

Lefevre, Remi; and Lagrue, Jean-Pierre, to Regie Nationale des Usines Renault. Adaptive process for controlling fuel injection in an engine. 4,593,666, Cl. 123-480.000.

Leger, Philippe P. J. M.: *See*—
Sorgeloos, Patrick P.; Versichele, Danny H.; Leger, Philippe P. J. M.; and Lavens, Patrick A., 4,593,647, Cl. 119-2.000.

Leggett & Platt, Incorporated: *See*—
Bustos, Rafael T., 4,593,826, Cl. 211-187.000.
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., 4,593,726, Cl. 140-89.000.
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., 4,593,809, Cl. 198-624.000.

Lehman, Andrew S. Newspaper holder. 4,593,934, Cl. 281-45.000.

Lehner, Thomas; and Giasuddin, Abu S. M., to Council of Governors of the United Medical and Dental Schools of Guy's and St. Thomas's Hospitals. Antigenic materials. 4,594,244, Cl. 424-87.000.

Leiber, Heinz, to Robert Bosch GmbH. Yaw-compensated vehicle anti-skid system. 4,593,955, Cl. 303-106.000.

Leiner, Howard H.: *See*—
Russell, David B.; Gitlitz, Melvin H.; Leiner, Howard H.; Khuddus, Mo A.; and Berger, Abe, 4,594,365, Cl. 523-122.000.

Leland Stanford Jr. University, The Board of Trustees of the: *See*—
Katsuki, Tsutomu; and Sharpless, Karl B., 4,594,439, Cl. 549-523.000.

LeMahieu, Ronald A., to Hoffman-La Roche Inc. Naphthalenyloxy substituted carboxylic acids. 4,594,442, Cl. 560-053.000.

Lemaire, Jean-Paul E.; and Renard, Lucien P., to Cockerill Sambre S.A. Process and an apparatus for baking an organic coating which has been applied to a substrate. 4,594,266, Cl. 427-55.000.

LeMasters, Donald P.: *See*—
Fischer, William P.; LeMasters, Donald P.; and Harbison, William C., 4,594,290, Cl. 428-212.000.

Lemmer, Helmut, to Square D Starkstrom GmbH. Switch bridge arrangement for an electrical switch. 4,594,484, Cl. 200-16.00A.

Lentz, Carl M.; Overton, James R.; and Cornell, David D., to Eastman Kodak Company. Carbonylation process for the production of aromatic acids and derivatives thereof. 4,594,445, Cl. 560-103.000.

Leo Pharmaceutical Products: *See*—
von Daehne, Welf, 4,594,246, Cl. 424-114.000.

Leonard, Willie B. Spool valve. 4,593,719, Cl. 137-625.660.

Leone, David A.; and Marks, Douglas C., to Westinghouse Electric Corp. Molded case circuit breaker with a trip mechanism having an intermediate latch lever. 4,594,491, Cl. 200-325.000.

Leonhard Schmid KG: *See*—
Mordstein, Johann; and Karg, Erwin, 4,593,863, Cl. 241-92.000.

Les Cables de Lyon: *See*—
Clement, Jean-Joseph; and Lafuente, Claude A., 4,593,971, Cl. 350-96.200.

Levasseur, Joseph E. Valve. 4,593,717, Cl. 137-556.600.

Levesque, Guy; and Tozzolino, Pierre, to Societe Nationale Elf Aquitaine (Production). Mono- and dithioic esters, their preparation and uses. 4,594,150, Cl. 209-166.000.

Levine, Peter A., to RCA Corporation. Transfer smear reduction in line transfer CCD imagers. 4,594,612, Cl. 358-213.000.

Levine, Robert A.; and Wardlaw, Stephen C. Method of enhancing separation of abnormally light red cells from granulocytes in a centrifuged blood sample. 4,594,165, Cl. 210-767.000.

Lew, Hyok S.; and Stranahan, Michael. Sky-slide system from elevated structures. 4,593,787, Cl. 182-3.000.

Lewin, Hans G.; and Finck, Lothar, to Mannesmann Aktiengesellschaft. Support roll in a machine for continuous casting. 4,593,744, Cl. 164-448.000.

Lewis, Henry G., Jr.; and Schiff, Leonard N., to RCA Corporation. Demodulator for sampled chrominance signals including a Nyquist filter for recovering wideband I color difference signals. 4,594,607, Cl. 358-23.000.

Lewkowicz, Shlomo, to University of Utah. Electronic stethoscope. 4,594,731, Cl. 381-67.000.

LGZ Landis & Gyr Zug AG: *See—*
Halder, Mathis, 4,594,547, Cl. 324-141.000.

Lichti, Wayne P.: *See—*
Hostatter, Alfred F.; Lichti, Wayne P.; and Papp, John G., 4,594,219, Cl. 419-8.000.

Liebetraut, Klaus A.: *See—*
Langlois, Jacques A. E.; and Liebetraut, Klaus A., 4,594,065, Cl. 425-150.000.

Lien, Eldar K.; and Caspersen, Sverre, to Geophysical Company of Norway A.S. Gun cable termination. 4,594,696, Cl. 367-144.000.

Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, to Kali-Chemie Pharma GmbH. Isomeric 2-chloromethyl-1,4-benzodiazepine or 3-chloro-1,5-benzodiazocine compound. 4,594,436, Cl. 549-359.000.

Liermann, Peter: *See—*
Neuhaus, Detlev; Hesse, Karl-Heinz; Ruhnau, Gerhard; and Liermann, Peter, 4,594,571, Cl. 340-52.00F.

Lignes Telegraphiques et Telephoniques LTT: *See—*
Niquel, Maurice; Gourdon, Claude; and Rouxel, Jean, 4,594,728, Cl. 375-116.000.

Lilienthal, Johannes H., to Societe Avitex. Double chamber aerosol container. 4,593,836, Cl. 222-136.000.

Lilienthal, Walter B., to Conoco Inc. Removal of pipe dope constrictions. 4,593,764, Cl. 166-312.000.

Lima Electric Co., Inc.: *See—*
Unnewehr, Lewis E., 4,594,632, Cl. 361-33.000.

Lin, Kaung-Far: *See—*
Thompson, Gregory J.; Lin, Kaung-Far; and Penner, David W., 4,594,322, Cl. 435-95.000.

Linder, Franz: *See—*
Schafer, Hartmut; and Linder, Franz, 4,594,021, Cl. 404-14.000.

Lindstrom, Judy; Ector, W. Lane, Jr.; and Trott, Arthur F., to Concept, Inc. Electrosurgery electrode. 4,593,691, Cl. 128-303.140.

Ling, Huei: *See—*
Hao, Hsieh T.; Ling, Huei; Sachar, Howard E.; Weiss, Jeffrey; and Yamour, Yannis J., 4,594,655, Cl. 364-200.000.

Lingafelter, Jerry, to Geo Max Drill Corp. Downhole bearing assembly. 4,593,774, Cl. 175-107.000.

Linley, Francis M., Jr., to Universal Thread Grinding Company. Lubricated drive mechanism. 4,593,572, Cl. 74-89.150.

Linton, Derek, to Linton Systems Limited. Building structure. 4,593,509, Cl. 52-262.000.

Linton Systems Limited: *See—*
Linton, Derek, 4,593,509, Cl. 52-262.000.

Lion Corporation: *See—*
Naganuma, Takeshi; Miyagawa, Natsumi; Ozawa, Toshiyuki; and Tamura, Kazutoshi, 4,594,242, Cl. 424-57.000.

Liu, Dean-Yuan; Guy, Jon S.; Siu, Howard W. H.; and Shaver, Michael A., to Sanders Associates, Inc. Thermal printer. 4,594,597, Cl. 346-76.0PH.

Livingston, Rodney S., to Discovision Associates. Fluid bearing for axially movable head. 4,594,702, Cl. 369-45.000.

Lloyd, Stephen R.; and Samelson, Charles F. Monitor for an anti-apnea device. 4,593,686, Cl. 128-136.000.

Lluansi, Michel: *See—*
Lacoude, Michel; Lluansi, Michel; and Munier, Philippe, 4,594,115, Cl. 148-12.00B.

Lo, Young S.; and Mays, Richard P., to A. H. Robins Company, Inc. Process for preparing 3-phenoxy-1-azetidines and carboxamide derivatives. 4,594,189, Cl. 260-239.00A.

Lobb, Thomas T.: *See—*
Keahey, Sammie G.; Keizer, Alan S.; and Lobb, Thomas T., 4,593,452, Cl. 29-564.600.

Loch, Werner: *See—*
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,594,136, Cl. 204-181.700.

Lodge, Kevin J.: *See—*
Brettle, Jack; Lodge, Kevin J.; Loggie, Nicholas J.; Hughes, Simon M. P.; and Howell, William G., 4,594,472, Cl. 174-35.0GC.

Loggie, Nicholas J.: *See—*
Brettle, Jack; Lodge, Kevin J.; Loggie, Nicholas J.; Hughes, Simon M. P.; and Howell, William G., 4,594,472, Cl. 174-35.0GC.

Logging Development Corporation: *See—*
Hamilton, Douglas D., 4,593,733, Cl. 144-34.00R.

Loker, Ernest B., to Hydrasearch Co., Inc. Coupling for thin-walled flexible hose. 4,593,942, Cl. 285-253.000.

Longoni, Angelo: *See—*
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,352, Cl. 514-332.000.
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,451, Cl. 564-44.000.

Longsworth, Ralph C., to Air Products and Chemicals, Inc. Method and apparatus for improving the sensitivity of a leak detector utilizing a cryopump. 4,593,530, Cl. 62-55.500.

Lopez, Carlos; Watanabe, Kyoichi A.; Reichman, Uri; and Fox, Jack J., to Sloan-Kettering Institute for Cancer Research. Anti-herpes virus compositions containing 5-substituted 1-2'(deoxy-2'-substituted-β-d-arabinofuranosyl)pyrimedene nucleosides. 4,594,339, Cl. 514-42.000.

Lopez, Wallace, to Astrl Corporation. Air conditioning system. 4,594,084, Cl. 62-5.000.

Losch, Gunter: *See—*
Kunze, Siegmar; Losch, Gunter; Dippel, Theodor; Laske, Dietrich; and Hubner, Walter, 4,594,186, Cl. 252-628.000.

Loveless, Frederick C.; Merijanian, Aspet V.; Smudin, David J.; and Nudenberg, Walter, to Uniroyal Chemical Company, Inc. Method for the oligomerization of alpha-olefins. 4,594,469, Cl. 585-511.000.

LTV Aerospace and Defense Company: *See—*
Bourland, Gordon, Jr.; and Price, Howard M., 4,594,120, Cl. 156-155.000.

LTV Energy Products Company: *See—*
Whightsil, Gary L., Sr., 4,593,941, Cl. 285-165.000.

Lubrizol Corporation, The: *See—*
Tipton, Craig D.; and Grover, Kent B., 4,594,378, Cl. 524-106.000.

Ludszeweit, Dieter: *See—*
Wahle, Gunter; Ludszeweit, Dieter; and Heitmann, Uwe, 4,593,704, Cl. 131-84.300.

Luhn, Ernst: *See—*
Isselstein, Fritz; Luhn, Ernst; Coen, Gunther; Oberhoff, Dietmar; and Keck, Roland, 4,593,567, Cl. 73-643.000.

Luhr, Jurgen: *See—*
Hoft, Peter; Peter, Wolfgang; Hacke, Heinz; Luhr, Jurgen; Bergsteiner, Johann; Drobe, Wolfgang; Engelke, Fritz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,593,834, Cl. 220-273.000.

Lumenello, Peter. Removable window security guard. 4,593,492, Cl. 49-57.000.

Lummus Crest, Inc.: *See—*
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, 4,594,433, Cl. 549-256.000.

Lund, Stellan: *See—*
Andersson, Jonny; and Lund, Stellan, 4,593,845, Cl. 227-117.000.

Lundak, Robert L., to University of Calif., The Regents of the. High fusion frequency fusible lymphoblastoid cell line. 4,594,325, Cl. 435-240.000.

Lusseau, Marcel: *See—*
Bissardon, Andre ; Gourlandt, Jean-Pierre; Chastan, Gilles; and Lusseau, Marcel, 4,594,154, Cl. 210-105.000.

Lyons, A. William, II: *See—*
Brewer, Howard E.; and Lyons, A. William, II, 4,594,672, Cl. 364-520.000.

Lytton, Glenn E.: *See—*
Burgess, W. D.; Lytton, Glenn E.; and Nash, Ronald S., 4,593,436, Cl. 19-105.000.

M.P.M. Industries Inc.: *See—*
Meray-Hovarth, Andrew G.; Myers, Ricky W.; and Palmberg, Robert A. A., 4,593,449, Cl. 29-527.100.

M&T Chemicals Inc.: *See—*
Russell, David B.; Gitlitz, Melvin H.; Leiner, Howard H.; Khuddus, Mo A.; and Berger, Abe, 4,594,365, Cl. 523-122.000.

MacDonald, Stuart G.: *See—*
Jakubowicz, Raymond F.; and MacDonald, Stuart G., 4,593,837, Cl. 222-288.000.

Machida, Hiroshi: *See—*
Minegishi, Keiichi; Akiba, Tokuji; Katayama, Keiichi; and Machida, Hiroshi, 4,594,209, Cl. 264-66.000.

MADAG Maschinen-und Apparatebau Dietikon AG: *See—*
de Lorenzi, Silvano, 4,593,616, Cl. 101-163.000.

Madden, Michael J. Manhole assembly with water barrier. 4,593,714, Cl. 137-371.000.

Maeda Industries, Ltd.: *See—*
Ozaki, Nobuo, 4,593,799, Cl. 192-46.000.

Maehara, Kenso: *See—*
Ishii, Koji; and Maehara, Kenso, 4,593,619, Cl. 101-409.000.

Mag-Sep Corp.: *See—*
Andres, Uri T.; Devernoe, Alan L.; and Walker, Michael S., 4,594,149, Cl. 209-1.000.

Magic Chef: *See—*
Sargunam, Issac P., 4,593,677, Cl. 126-214.00C.

Magnetic Activated Particle Sorting, Inc.: *See—*
Schwartz, Abraham, 4,593,980, Cl. 350-529.000.

Mahaffey, Robert L., Jr.: *See—*
Moore, Patrick D.; and Mahaffey, Robert L., Jr., 4,594,454, Cl. 564-305.000.

Mahoney, Dennis F.; and Block, William V., to Economics Laboratory, Inc. Polyalkylene polyamine-glycol accelerators for paint removal compositions. 4,594,176, Cl. 252-153.000.

Maier, Andreas, to Hartmetallwerkzeugfabrik Andreas Maier GmbH & Co. KG. Multigroove drill bit with angled frontal ridges. 4,594,034, Cl. 408-230.000.

Maier, Edward E., to United States Steel Corporation. Process for removing ammonia and acid gases from process streams. 4,594,131, Cl. 203-26.000.

Mair, Eduard; and Zoeke, Siegfried, to Siemens Aktiengesellschaft. Paper deflection roller for a printer or copier means functioning on the principle of electrophotography. 4,593,480, Cl. 34-78.000.

Majima, Hidekazu: *See—*
Takeuchi, Hiroshi; Fukushima, Hirotaka; and Majima, Hidekazu, 4,593,801, Cl. 192-70.150.

Mak, Gerd; and Ploppa, Jurgen, to H. Stoll GmbH and Company. Electromagnetically-controlled flat knitting machine. 4,594,585, Cl. 340-679.000.

Malabarba, Adriano: *See—*
Strazzolini, Paolo; Malabarba, Adriano; and Cavalleri, Bruno, 4,594,187, Cl. 530-332.000.

Maleci, Guglielmo; and Latini, Tullio, to FAP Praticus S.p.A. Device for connecting an upright and a horizontal member in a tubular metal scaffold for a building. 4,594,019, Cl. 403-246.000.

Malot, James J.: *See—*
Visser, Melvin J.; and Malot, James J., 4,593,760, Cl. 166-267.000.

Maniar, Mohammad Y.; and Dines, Steven, to Advanced Micro Devices, Inc. Circuit for controlling external bipolar buffers from an MOS peripheral device. 4,594,654, Cl. 364-200.000.

Manlow, Terence V., to Rees Construction Services Limited. Tunnelling and tunnel relining equipment. 4,594,025, Cl. 405-147.000.

Manner, Reinhard; Schaefer, Hans; Voigt, Carl; and Pfeifer, Wolf D., to Degussa Aktiengesellschaft. Process and apparatus for the production of hydrogen cyanide. 4,594,234, Cl. 423-376.000.

Mannesmann Aktiengesellschaft: *See—*
Lewin, Hans G.; and Finck, Lothar, 4,593,744, Cl. 164-448.000.

Mantke, Joachim: *See—*
Seidel, Henning; Wildenau, Wolfgang; and Mantke, Joachim, 4,593,707, Cl. 131-336.000.

Manuli Autoadesivi S.p.A.: *See—*
Galli, Graziano; and Pina, Felice, 4,594,277, Cl. 428-40.000.

Mao, Roger A., to American Microsystems, Inc. Current mirror digital to analog converter. 4,594,577, Cl. 340-347.0DA.

Maresca, Louis M.: *See—*
Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., 4,594,404, Cl. 528-174.000.

Margraf, Dallas A., to Hobart Corporation. Dropped-article sensor and wrapping machine interrupt. 4,593,515, Cl. 53-56.000.

Marier, Gregory J., to Yamaha Hatsudoki Kabushiki Kaisha. Stabilizer system for a snowmobile. 4,593,921, Cl. 280-21.00R.

Marietta, Kala J.: *See—*
Guenthner, Russell W.; Shelly, William A.; Presley-Nelson, Gary R.; Marietta, Kala J.; and Wade, R. Morse, 4,594,659, Cl. 364-200.000.

Maris, Mark A.: *See—*
Brown, Chris W.; Maris, Mark A.; Lavery, Donald S.; Caputo, Bernard; and Model, Mark, 4,594,510, Cl. 250-339.000.

Maritime Hydraulics A.S.: *See—*
Skeie, Bjarne E., 4,593,773, Cl. 175-85.000.

Marketing Displays, Inc.: *See—*
Seely, James R.; and Ursprung, Cecil E., 4,593,879, Cl. 248-624.000.

Marks, Christopher: *See—*
Williams, Robert L.; and Marks, Christopher, 4,593,464, Cl. 29-879.000.

Marks, Douglas C.: *See—*
Leone, David A.; and Marks, Douglas C., 4,594,491, Cl. 200-325.000.

Marlowe, James L.: *See—*
Bowman, Dennis C.; and Marlowe, James L., 4,594,475, Cl. 174-152.00R.

Maroszek, Raymond V., to James River Corporation. Microwave package including a resiliently biased browning layer. 4,594,492, Cl. 219-10.55E.

Marsh, Paul G.: *See—*
Blakley, Earl T.; and Marsh, Paul G., 4,593,861, Cl. 241-46.020.

Marshall, John P.: *See—*
Newsome, Peter M.; Mullan, Noel A.; and Marshall, John P., 4,594,195, Cl. 558-412.000.

Martin, Eugene G.; and Risser, Dale M., to Favorite Manufacturing, Inc. Apparatus and method for the transverse halving of poultry carcasses. 4,593,435, Cl. 17-52.000.

Martin, Michel: *See—*
Pignal, Maurice; Tridon, Max; and Martin, Michel, 4,593,479, Cl. 34-58.000.

Martin, William J.: *See—*
Barclay, Terry W.; Cielo, John R.; Martin, William J.; and Trushell, James B., 4,594,588, Cl. 340-771.000.

Marty, Michel: *See—*
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Maruhashi, Shigeaki; Hoshino, Kazuo; Uematsu, Yoshihiro; Miyakusu, Katsuhisa; and Fujimura, Takehiko, to Nisshin Steel Co., Ltd. Process for producing strip of corrosion resistant alloy steel. 4,594,114, Cl. 148-12.0EA.

Maruyama, Asao: *See—*
Kondo, Hirokazu; and Maruyama, Asao, 4,593,808, Cl. 198-570.000.

Marvin Glass & Associates: *See—*
Zaruba, John V.; Baran, Patrick S.; Webb, Terry E.; and Disko, Harry, 4,594,071, Cl. 446-99.000.

Marzetta, Thomas L.: *See—*
Kimball, Christopher V.; and Marzetta, Thomas L., 4,594,691, Cl. 367-32.000.

Marzluf, Werner, to Maschinenfabrik Hellmut Geiger GmbH & Co. KG. Electric fish-repelling device. 4,593,648, Cl. 119-3.000.

Marzolph, Gerhard: *See—*
Bonse, Gerhard; Marzolph, Gerhard; and Blank, Heinz U., 4,594,427, Cl. 548-226.000.

Maschinenfabrik Hellmut Geiger GmbH & Co. KG: *See—*
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Masco Corporation of Indiana: *See—*
Spangler, Anthony G.; and Myers, Kenneth E., 4,593,430, Cl. 16-121.000.

Mase, Masahiro: *See—*
Kikkawa, Seiichi; Ogata, Hisanao; Hakuraku, Yoshinori; Mase, Masahiro; Tsumaki, Nobuo; Awada, Yoshihisa; and Kajiwara, Hiroki, 4,593,835, Cl. 222-131.000.

Maskinfabrikken Dan-Trim ApS: *See—*
Pedersen, Marianne G.; and Vaughan, Michael, 4,593,629, Cl. 110-172.000.

Massachusetts Institute of Technology: *See—*
Gusella, James F.; Housman, David; Keys, Cheryl; Varsanyi-Breiner, Aviva; Puck, Theodore T.; Jones, Carol; and Kao, Fa-Ten, 4,594,318, Cl. 435-6.000.

Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, to Montedison S.p.A. Alkynyl containing benzoyl-ureas exerting an insecticidal activity. 4,594,352, Cl. 514-332.000.

Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, to Montedison S.p.A. Benzoyl-ureas exerting an insecticide activity. 4,594,451, Cl. 564-44.000.

Masteller, Sara B.: *See—*
Fujawa, Charles S.; and Masteller, Sara B., 4,594,668, Cl. 364-431.020.

Master Contact Lens Labs Inc.: *See—*
Scilipoti, Joseph F., 4,593,981, Cl. 351-161.000.

Masuda, Akira: *See—*
Omori, Toshihiko; Sakakibara, Shuzi; Kato, Masaaki; and Masuda, Akira, 4,593,664, Cl. 123-446.000.

Masugi, Takashi: *See—*
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,594,446, Cl. 560-168.000.

Mathais, Henri: *See—*
Lantz, Andre ; Mathais, Henri; and Dupuis, Gerard, 4,594,177, Cl. 252-194.000.

Mathumoto, Sigemi: *See—*
Muramatsu, Eiichi; Mathumoto, Sigemi; and Nagoshi, Fumiya, 4,594,387, Cl. 525-67.000.

Matoba, Kiyoshi, to Nohmi Bosai Kogyo Co. Ltd. Fire alarm system. 4,594,581, Cl. 340-531.000.

Matsuda, Kosei: *See—*
Tajima, Katsuichirou; and Matsuda, Kosei, 4,593,852, Cl. 237-12.30A.

Matsumoto, Akio, to Mitsubishi Denki Kabushiki Kaisha. Control device for a power-driven air pump for a car. 4,593,524, Cl. 60-289.000.

Matsumoto, Hiroshi: *See—*
Hagiwara, Hideo; and Matsumoto, Hiroshi, 4,593,814, Cl. 206-387.000.
Kobayashi, Kenji; Yasuda, Tsutomu; Matsumoto, Hiroshi; and Sone, Humiki, 4,593,701, Cl. 128-667.000.

Matsunaga, Toru: *See—*
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Matsunoshita, Fumirou; and Sato, Kiyosumi, to Fujitsu Limited. Data processing system for preventing machine stoppage due to an error in a copy register. 4,594,710, Cl. 371-16.000.

Matsuo, Takeshi: *See—*
Tamura, Sakae; Hosoya, Masahiro; Matsuo, Takeshi; and Uehara, Tsutomu, 4,593,994, Cl. 355-3.0SC.

Matsuo, Yoshihiro: *See—*
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Matsushita Electric Industrial Company, Limited: *See—*
Fujii, Katsuyoshi, 4,594,576, Cl. 340-347.0AD.
Fukushima, Fumio; Terada, Jiro; and Nitta, Tsuneharu, 4,594,569, Cl. 338-35.000.
Hayakawa, Yoshihiro; Nakamura, Yasuhiro; Tachita, Ryobun; and Yano, Tsutomu, 4,593,700, Cl. 128-663.000.
Kanchiku, Hiroshi; Kajino, Jiro; and Saito, Fuminari, 4,594,624, Cl. 360-90.000.
Yoneno, Hiroshi; Matsuo, Yoshihiro; and Ishihara, Shoichi, 4,594,279, Cl. 428-69.000.

Matsuura, Masataka: *See—*
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Matsuzawa, Tadahiro: *See—*
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Mattel, Inc.: *See—*
Cowell, Robert L., 4,594,072, Cl. 446-227.000.

Matter, Winfried: *See—*
Stolz, Gerd, 4,594,275, Cl. 428-36.000.

Matthews, Dean A., to Allis-Chalmers Corporation. Automatic sequencing circuit for lift cylinders. 4,593,791, Cl. 187-9.00E.

Mattila, Jari. Method and apparatus for packing goods. 4,593,517, Cl. 53-441.000.

Mattson, Evert C. Digital audio differential drive system. 4,594,652, Cl. 364-167.000.

Maudsley, Andrew A., to Advanced NMR Systems, Inc. High frequency rf coil for NMR device. 4,594,566, Cl. 333-219.000.

Mauser-Werke GmbH: *See—*
Langos, Peter, 4,594,067, Cl. 425-451.900.

Mayer, Hubert, to Bata Schuh AG. Modular substrate sole for footwear. 4,593,482, Cl. 36-7.500.

Mayes, Daniel J., to Great Neck Saw Manufacturing, Inc. Level with slotted magnet support. 4,593,475, Cl. 33-347.000.

Mayhew, Thomas C. Survey vehicle. 4,593,474, Cl. 33-264.000.

Mays, Richard P.: *See—*
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Mazda Motor Corporation: *See—*
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Mazzone, Jean-Pierre: *See—*
Dobigny, Bernard; and Mazzone, Jean-Pierre, 4,594,288, Cl. 428-339.000.
McCarthy, Michael D.; and Rhodes, Keith H., to Metko, Inc. Livestock feed conveyor including provision for multiple feeder bunks. 4,593,651, Cl. 119-52.00B.
McCarthy, Richard C.: *See—*
Tweed, George C., Jr.; and McCarthy, Richard C., 4,594,570, Cl. 340-21.000.
McClintock, William A., to Phillips Petroleum Company. Rod baffle heat exchange apparatus and method. 4,593,757, Cl. 165-162.000.
McConnell, Peter J., to McConnell Research Enterprises Pty. Ltd. Exhaust gas liquid heating system for internal combustion engines. 4,593,753, Cl. 165-51.000.
McConnell Research Enterprises Pty. Ltd.: *See—*
McConnell, Peter J., 4,593,753, Cl. 165-51.000.
McConnell, Ronald F., to Du Pont de Nemours, E. I., and Company. Apparatus for preparing a contoured preform. 4,594,122, Cl. 156-433.000.
McCready, Russell J., to General Electric Company. Modified thermoplastic copolyetherimide ester elastomers. 4,594,377, Cl. 524-101.000.
McCullough, Harold E., to AT&T Bell Laboratories. Terminal pin shorting switch apparatus. 4,594,490, Cl. 200-248.000.
McGhie, Joseph A.: *See—*
Boden, Richard M.; and McGhie, Joseph A., 4,594,464, Cl. 568-592.000.
McGowan, Bernard J. Inlet clamp and screen. 4,594,157, Cl. 210-163.000.
McInerney, Michael J., to Vapor Corporation. Combustion and feedwater controller for a flash boiler. 4,593,654, Cl. 122-451.200.
McKay, William F.; and Walker, Peter S., to Pfizer Hospital Products Group Inc. Bone cement applicator. 4,593,685, Cl. 128-92.00E.
McKinney, James M.; and Hodson, John G., to Graniteville Company. Coated fabric. 4,594,286, Cl. 428-245.000.
McKinnie, Bonnie G.: *See—*
Ranken, Paul F.; and McKinnie, Bonnie G., 4,594,453, Cl. 564-440.000.
McLerran, Carl M.; and Johnson, Robert E. Bicycle exercising means and method. 4,593,898, Cl. 272-73.000.
McLoughlin, Robert H.: *See—*
Cook, John A.; Park, George B.; and McLoughlin, Robert H., 4,594,299, Cl. 429-129.000.
McNally, Mark J., to Perkin-Elmer Corporation, The. Apparatus for analyzing coherent radiation. 4,594,002, Cl. 356-346.000.
McNeilab, Inc.: *See—*
Scott, Malcolm K., 4,594,351, Cl. 514-320.000.
McVay, James D.; and Take, Hermann, to Continuous Casting Systems Inc. Continuous casting apparatus having oscillator for mold tube. 4,593,743, Cl. 164-416.000.
Mead Corporation, The: *See—*
Adkins, David G., 4,594,370, Cl. 523-208.000.
Fershko, Jane S.; and Lackey, Robert W., 4,593,823, Cl. 211-49.100.
Mechanical Technology Incorporated: *See—*
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Medasonics, Inc.: *See—*
Flowers, Edward P., 4,593,692, Cl. 128-327.000.
Mega Industrial Products, Inc.: *See—*
Hughes, Rodney F., 4,594,020, Cl. 403-343.000.
Mehnert, Johannes; and Effenberger, Alfred. Method for the manufacture of tubular preforms of plastics. 4,594,212, Cl. 264-163.000.
Melcher, Roy L.: *See—*
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Menke, Jupp: *See—*
Kilger, Fridbert; Roth, Siegfried; Breithaupt, Rupert; Menke, Jupp; and Zeifang, Gunter, 4,594,503, Cl. 250-203.00R.
Menshen, Arnold. Measurement coupling. 4,593,713, Cl. 137-322.000.
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Meray-Hovarth, Andrew G.; Myers, Ricky W.; and Palmberg, Robert A. A., to M.P.M. Industries Inc. Manufacture of foam-filled panels and cores therefor. 4,593,449, Cl. 29-527.100.
Merck & Co., Inc.: *See—*
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Cheung, Yak-Fa; Thorsett, Eugene D.; and Patchett, Arthur A., 4,594,341, Cl. 514-211.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidensschink, Rudolf; and Romer, Michael, 4,594,465, Cl. 568-642.000.
Mercury Metal Products, Inc.: *See—*
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Merger, Franz; Hettinger, Peter; Hupfer, Leopold; and Paetsch, Juergen, to BASF Aktiengesellschaft. Preparation of trimethylolalkanes from alkanals and formaldehyde. 4,594,461, Cl. 568-853.000.
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Merritt, John W.; Wurzburg, Henry; and Kelley, Stephen H., to Motorola, Inc. High speed limited distance multiplexed data communications modem using a single twisted pair of conductors. 4,594,707, Cl. 370-91.000.
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Metals, Ltd.: *See—*
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McCarthy, Michael D.; and Rhodes, Keith H., 4,593,651, Cl. 119-52.00B.
Meyer, Carl-Ludwig: *See—*
Gengenbach, Bruno; Meyer, Carl-Ludwig; Michal, Roland; and Remenyi, Ferenc, 4,594,489, Cl. 200-151.000.
Meyer, Daniel, to Communications Systems, Inc. Modular telephone line coupler. 4,593,966, Cl. 339-205.000.
Meyer, Willy: *See—*
Schurter, Rolf; Fory, Werner; and Meyer, Willy, 4,594,097, Cl. 71-93.000.
Meyers, Richard F.; Rossi, Francis; and Strahle, Werner, to International Business Machines Corporation. Digital storage apparatus including sections exhibiting different access speeds. 4,594,690, Cl. 365-230.000.
Mezger, Hans, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Method and apparatus for operating a piston driven internal combustion engine having an exhaust gas turbocharger. 4,593,525, Cl. 60-606.000.
Mezger, Hans, to Dr. Ing. H.c.F. Porsche Aktiengesellschaft. Valve seat ring cooling apparatus. 4,593,655, Cl. 123-41.770.
Michael, George W., III, to AMP Incorporated. Method for trimming coaxial cable. 4,594,029, Cl. 408-1.00R.
Michaelsen, Randolph C. H. Exercise device. 4,593,902, Cl. 272-93.000.
Michal, Roland: *See—*
Gengenbach, Bruno; Meyer, Carl-Ludwig; Michal, Roland; and Remenyi, Ferenc, 4,594,489, Cl. 200-151.000.
Michelson, Gunnar P. Light valve. 4,594,539, Cl. 318-640.000.
Micklin, Steven H.: *See—*
Beauman, William H.; Jarog, Dean J.; and Micklin, Steven H., 4,594,361, Cl. 521-28.000.
Micro Control Systems, Inc.: *See—*
Davies, David L., 4,593,470, Cl. 33-1.0CC.
Microdot Inc.: *See—*
Witte, Erwin C., 4,594,039, Cl. 411-311.000.
Mignani, Gerard; and Morel, Didier, to Rhone-Poulenc Sante. Process for selective C-alkylation of phenols. 4,594,460, Cl. 568-794.000.
Mikawa, Isao; Endoh, Masahiro; Kaji, Masayuki; Kishida, Yoshitaka; and Yamamoto, Nobuhiro, to Circle Iron Work Co., Ltd. Transplanter provided with seedlings selector. 4,593,632, Cl. 111-3.000.
Milberger, Lionel J., to Vetco Offshore, Inc. Pile driving connector. 4,593,944, Cl. 285-321.000.
Miller, Bernhard: *See—*
Bonitz, Jorg; Entemann, Robert; Miller, Bernhard; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, 4,593,553, Cl. 73-35.000.
Miller, Deborah S.: *See—*
Wegman, Richard W.; and Miller, Deborah S., 4,594,463, Cl. 568-487.000.
Miller, Gary E.; and Sheeks, Perry, to Agrimatic Corporation. Egg injection method and apparatus. 4,593,646, Cl. 119-1.000.
Miller, Larry. Rescue apparatus. 4,593,788, Cl. 182-3.000.
Miller, Michael J.: *See—*
Scheithauer, Richard A.; Miller, Michael J.; and Vanderpool, Clarence D., 4,594,230, Cl. 423-140.000.
Miller, Robert A. Exercise jumping rope. 4,593,899, Cl. 272-75.000.
Millhimes, Wayne L.; and Murren, Daniel J., to AMP Incorporated. Power entry connector. 4,593,960, Cl. 339-42.000.
Milliken Research Corporation: *See—*
Moore, Patrick D.; and Mahaffey, Robert L., Jr., 4,594,454, Cl. 564-305.000.
Millmaster Onyx Group, Inc.: *See—*
Dudzinski, Zdzislaw W., 4,594,455, Cl. 564-463.000.
Milsco Manufacturing Company: *See—*
Hill, Kevin E., 4,593,875, Cl. 248-429.000.
Minakuchi, Tadashi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic photographing device for video camera. 4,593,985, Cl. 354-238.100.
Minato, Tetsunori: *See—*
Tanaka, Minoru; Niwano, Kazuhisa; Minato, Tetsunori; and Oka, Yastami, 4,594,106, Cl. 106-1.120.
Minderhoud, Johannes K.; and Sie, Swan T., to Shell Oil Company. Process for the preparation of middle distillates from syngas. 4,594,468, Cl. 585-310.000.
Minegishi, Keiichi; Akiba, Tokuji; Katayama, Keiichi; and Machida, Hiroshi, to Chichibu Cement Co., Ltd. Process for the preparation of voltage non-linearity type resistors. 4,594,209, Cl. 264-66.000.
Minnesota Mining and Manufacturing Company: *See—*
Ishida, Takuzo, 4,594,307, Cl. 430-203.000.
Kreil, Curtis L.; and Sidney, LuAnn, 4,594,262, Cl. 427-44.000.
Relyea, Keith E., 4,594,276, Cl. 428-40.000.
Sabongi, Gebran J.; Poon, Stephen S. C.; and Lea, Bernard A., 4,594,312, Cl. 430-339.000.
Minolta Camera Kabushiki Kaisha: *See—*
Imaizumi, Masaru, 4,593,993, Cl. 355-3.00R.

Kimura, Kazuo; Mukai, Hiromu; and Shibuya, Taro, 4,593,984, Cl. 354-219.000.
Mirenna, Luigi: *See*—
Colle, Roberto; Gozzo, Franco; and Mirenna, Luigi, 4,594,353, Cl. 514-383.000.
Mita Industrial Co., Ltd.: *See*—
Kubo, Masahiko, 4,594,302, Cl. 430-42.000.
Mitch, John H., to Tektronix, Inc. Method of splicing elongate members of generally cylindrical form in a predetermined position. 4,594,121, Cl. 156-158.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
Imaki, Naoshi; and Nakanome, Takemi, 4,594,438, Cl. 549-462.000.
Nagasaka, Hideki, 4,594,310, Cl. 430-281.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Asayama, Yoshiaki; Yamada, Tetsusyo; and Hirate, Shintaro, 4,594,139, Cl. 204-410.000.
Fujiwara, Kenzo; Takeuchi, Norio; Nakatsuka, Yoji; Horita, Tsuyoshi; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,522, Cl. 310-42.000.
Haraga, Kousuke; Hattori, Katutoshi; and Yamamoto, Kazumi, 4,594,281, Cl. 428-172.000.
Horita, Tsuyoshi; Nakatsuka, Yoji; Fujiwara, Kenzou; Takeuchi, Norio; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,523, Cl. 310-42.000.
Itoh, Atsushi, 4,594,670, Cl. 364-513.000.
Iwaki, Yoshiyuki, 4,594,631, Cl. 361-20.000.
Kimura, Minoru; and Endo, Michitada, 4,593,532, Cl. 62-119.000.
Kinbara, Yoshihide, 4,594,650, Cl. 363-58.000.
Matsumoto, Akio, 4,593,524, Cl. 60-289.000.
Nagatomo, Hideaki; and Yasuda, Mitsuo, 4,593,609, Cl. 98-2.010.
Terauchi, Tsuneo, 4,594,049, Cl. 414-744.00R.
Ueguri, Shigeo; Tabata, Youichiro; Komura, Hirotsugu; and Ito, Toshio, 4,594,498, Cl. 219-137.0PS.
Yamamoto, Tomoichiro, 4,593,792, Cl. 187-29.00B.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Suzuki, Takashi; Kawakami, Takamasa; Koyama, Takeshi; Orisaku, Masami; Izaki, Kansei; Nakano, Rieko; and Mori, Akira, 4,594,330, Cl. 501-92.000.
Yoshikawa, Kyugo; and Matsuzawa, Tadahiro, 4,594,457, Cl. 568-473.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hashimoto, Kazuyoshi; Takemasa, Toshihiro; and Taniguchi, Nobuyuki, 4,593,548, Cl. 72-12.000.
Kawauchi, Toru, 4,594,293, Cl. 428-548.000.
Moriya, Muneo; Takemasa, Toshihiro; and Katayama, Keiichi, 4,593,549, Cl. 72-12.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Miyauchi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,594,269, Cl. 427-150.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Nakauchi, Jun; and Tahara, Yasuteru, 4,593,975, Cl. 350-96.340.
Yamamoto, Takashi; Nishida, Kozi; and Tateishi, Akio, 4,593,974, Cl. 350-96.340.
Mitsui Mining and Smelting Co., Ltd.: *See*—
Miyazaki, Kazuhide; and Sumida, Morimasa, 4,594,301, Cl. 429-228.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Shimomura, Toshitaka, 4,593,473, Cl. 33-169.00R.
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, to Toyota Jidosha Kabushiki Kaisha. Fine composite powder material and method and apparatus for making the same. 4,594,101, Cl. 75-0.50C.
Miwa, Zenichiro; and Nakagawa, Hiroshi, to Shinko Electric Co., Ltd. Linear pulse motor. 4,594,520, Cl. 310-12.000.
Miyagawa, Natsumi: *See*—
Naganuma, Takeshi; Miyagawa, Natsumi; Ozawa, Toshiyuki; and Tamura, Kazutoshi, 4,594,242, Cl. 424-57.000.
Miyagi, Masahiro: *See*—
Itoh, Masaaki; Kogure, Hiroshi; Iino, Kenji; Ochiai, Izumi; Kitayama, Yukio; and Miyagi, Masahiro, 4,593,756, Cl. 165-151.000.
Miyakusu, Katsuhisa: *See*—
Maruhashi, Shigeaki; Hoshino, Kazuo; Uematsu, Yoshihiro; Miyakusu, Katsuhisa; and Fujimura, Takehiko, 4,594,114, Cl. 148-12.0EA.
Miyamoto, Hisashi: *See*—
Ishikawa, Hiroshi; Uno, Tetsuyuki; Miyamoto, Hisashi; and Nakagawa, Kazuyuki, 4,594,347, Cl. 514-252.000.
Miyashita, Kunio: *See*—
Takahashi, Tadashi; Miyashita, Kunio; Kawamata, Syooichi; and Morinaga, Shigeki, 4,594,548, Cl. 324-208.000.
Miyata, Masanori: *See*—
Adachi, Hideki; Tomosada, Masahiro; Hirose, Masayuki; Miyata, Masanori; and Komiya, Yutaka, 4,593,999, Cl. 355-55.000.
Miyauchi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, to Mitsubishi Paper Mills, Ltd. Chemically resistant thermosensitive recording paper. 4,594,269, Cl. 427-150.000.
Miyazaki, Kazuhide; and Sumida, Morimasa, to Mitsui Mining and Smelting Co., Ltd. Lead-accumulator and active materials used therein. 4,594,301, Cl. 429-228.000.
Miyazawa, Hiroshi, to Kabushiki Kaisha Kobe Seiko Sho. Outrigger device for wheel-mounted working machines. 4,593,932, Cl. 280-765.100.
Mobil Oil Corporation: *See*—
Chang, Clarence D.; and Chu, Cynthia T. W., 4,594,333, Cl. 502-71.000.
Chester, Arthur W.; and Chu, Yung-Feng, 4,594,146, Cl. 208-111.000.
Hoehn, Gustave L., Jr., 4,593,770, Cl. 175-45.000.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,594,171, Cl. 252-49.600.
Krutchen, Charles M.; and Wu, Wen-Pao, 4,594,208, Cl. 264-53.000.
Pann, Keh; and Fields, Jerry L., 4,594,693, Cl. 367-43.000.
Penick, Joe E., 4,593,759, Cl. 166-261.000.
Tabak, Samuel A., 4,594,143, Cl. 208-46.000.
Model, Mark: *See*—
Brown, Chris W.; Maris, Mark A.; Lavery, Donald S.; Caputo, Bernard; and Model, Mark, 4,594,510, Cl. 250-339.000.
Moffett, Richard C. Memory refresh apparatus. 4,594,656, Cl. 364-200.000.
Mohnhaupt, Dietrich. Preparing polyolefine based opaque film. 4,594,211, Cl. 264-141.000.
Molina, Jorge W., to Deutsch Fastener Corp. Panel fastener. 4,594,040, Cl. 411-353.000.
Molins Limited: *See*—
Preston, Edward G.; and Stewart, David B., 4,593,706, Cl. 131-109.100.
Moloney, Paul J. Valve operating mechanism for internal combustion and like-valved engines. 4,593,658, Cl. 123-90.110.
Momose, Takashi: *See*—
Ishimaru, Hajime; Narushima, Katsuya; and Momose, Takashi, 4,594,054, Cl. 417-49.000.
Mondaine Watch Ltd.: *See*—
Affolter, Walter, 4,594,008, Cl. 368-276.000.
Monsanto Company: *See*—
Abdou-Sabet, Sabet; and Shen, Kuo-Shein, 4,594,390, Cl. 525-232.000.
Sikorski, James A.; and Schafer, David E., 4,594,093, Cl. 71-87.000.
Montedison S.p.A.: *See*—
Colle, Roberto; Gozzo, Franco; and Mirenna, Luigi, 4,594,353, Cl. 514-383.000.
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,352, Cl. 514-332.000.
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,451, Cl. 564-44.000.
Moore, Patrick D.; and Mahaffey, Robert L., Jr., to Milliken Research Corporation. P-formyl-N,N-dipolyoxyalkylenesubstitutedaniline. 4,594,454, Cl. 564-305.000.
Moore, Ryan C.; and Smith, Daniel P. Dual-suspension striking balls. 4,593,901, Cl. 272-78.000.
Moore, Victor S.; Veneski, Gerard A.; Parker, Tony E.; Rhodes, Joseph C., Jr.; Kraft, Wayne R.; and Stahl, William L., Jr., to International Business Machines Corp. Microword control system utilizing multiplexed programmable logic arrays. 4,594,661, Cl. 364-200.000.
Moosberg, Borje; S.; and Karlsson, Jarding U., to Abu Aktiebolag. Magnetic brake for braking the line spool of a fishing reel. 4,593,866, Cl. 242-84.52B.
Moplefan S.p.A.: *See*—
Vittone, Andrea; Chiappini, Giuseppe; and Di Paola, Massimo, 4,594,210, Cl. 264-70.000.
Mordstein, Johann; and Karg, Erwin, to Leonhard Schmid KG. Device for chopping up garden waste and the like. 4,593,863, Cl. 241-92.000.
Moreau, Francis: *See*—
Denise, Rene ; and Moreau, Francis, 4,593,938, Cl. 285-22.000.
Morel, Didier: *See*—
Mignani, Gerard; and Morel, Didier, 4,594,460, Cl. 568-794.000.
Moreno, Rodolfo, to Suave Shoe Corporation. Apparatus and method for joining the parts of shoe uppers by stitching. 4,593,634, Cl. 112-262.300.
Morgan, Morris E., to Morgan Products, Inc. Injector pump. 4,594,057, Cl. 417-385.000.
Morgan Products, Inc.: *See*—
Morgan, Morris E., 4,594,057, Cl. 417-385.000.
Morgand, Philippe: *See*—
Garconnat, Michel; and Morgand, Philippe, 4,594,695, Cl. 367-135.000.
Mori, Akira: *See*—
Suzuki, Takashi; Kawakami, Takamasa; Koyama, Takeshi; Orisaku, Masami; Izaki, Kansei; Nakano, Rieko; and Mori, Akira, 4,594,330, Cl. 501-92.000.
Mori, Yasunori: *See*—
Sasaki, Shoji; Mori, Yasunori; and Sugiura, Noboru, 4,593,667, Cl. 123-488.000.
Moridi, Said: *See*—
Desperben, Lydie; Sari, Hikmet; Moridi, Said; and Bonnerot, Georges, 4,594,725, Cl. 375-15.000.
Morikawa, Ikkyu; and Morikawa, Sinzi. Ink supplying apparatus for printing machine. 4,593,617, Cl. 101-350.000.
Morikawa, Seiichi, to Teac Corporation. Brushless, direct current motor with an energy dissipating circuit. 4,594,535, Cl. 318-254.000.
Morikawa, Sinzi: *See*—
Morikawa, Ikkyu; and Morikawa, Sinzi, 4,593,617, Cl. 101-350.000.
Morimi, Junki: *See*—
Osawa, Yoshitaka; Nishimura, Akira; Morimi, Junki; and Tobe, Mitsunobu, 4,594,285, Cl. 428-240.000.
Morimitsu, Shigeaki: *See*—
Hatae, Yasuhiko; and Morimitsu, Shigeaki, 4,594,608, Cl. 358-93.000.

Morimoto, Kiyoshi; Furuya, Keizo; and Toriuchi, Masaharu, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material with reducible photographically useful moiety releaser. 4,594,316, Cl. 430-559.000.

Morinaga, Shigeki: *See*—
Takahashi, Tadashi; Miyashita, Kunio; Kawamata, Syooichi; and Morinaga, Shigeki, 4,594,548, Cl. 324-208.000.

Morioka, Yuji; Yamasita, Sigeru; and Yano, Yoshiaki, to Sanyo Electric Co., Ltd. Lead storage battery. 4,594,300, Cl. 429-225.000.

Morisawa, Junichiro: *See*—
Takahashi, Youichi; Kashiwakura, Koji; Morisawa, Junichiro; and Kobayashi, Masahiro, 4,594,497, Cl. 219-130.210.

Morishita, Sadao: *See*—
Miyauchi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,594,269, Cl. 427-150.000.

Morita, Tamao. Case or bag covered with a magnet shielding material. 4,593,736, Cl. 150-147.000.

Morita, Yoshitsugu: *See*—
Hanada, Tsuneo; and Morita, Yoshitsugu, 4,594,134, Cl. 522-99.000.

Moriya, Muneo; Takemasa, Toshihiro; and Katayama, Keiichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of controlling a tension levelling equipment. 4,593,549, Cl. 72-12.000.

Morris, Carrol V., to Mercury Metal Products, Inc. Pressure and vacuum relief valve mechanism for a fluid storage tank. 4,593,711, Cl. 137-39.000.

Morrow Manufacturing Co., Inc.: *See*—
Watson, Gary Q., 4,593,500, Cl. 52-162.000.

Mort, Raymond W.: *See*—
Cronkhite, James D.; Haas, Thomas J.; and Mort, Raymond W., 4,593,870, Cl. 244-117.00R.

Moser, Bernhard: *See*—
Peetz, Wolfgang; Klaissle, Siegfried; Moser, Bernhard; and Muller, Norbert, 4,594,033, Cl. 408-156.000.

Mosnier, Francis, to Isover Saint-Gobain. Method and apparatus for distribution of fibres in a felt. 4,594,086, Cl. 65-4.400.

Moss, Brian F.; and Brent, Richard J., to Ciba-Geigy AG. Photographic enlarger. 4,593,998, Cl. 355-21.000.

Motorola, Inc.: *See*—
Birrittella, Mark S., 4,593,457, Cl. 29-576.00B.
Burke, Timothy M., 4,594,591, Cl. 340-825.070.
Byrns, John P., 4,594,657, Cl. 364-200.000.
Donoghue, William J., 4,594,689, Cl. 365-182.000.
Folk, Lee E.; and Asher, Reginald K., 4,594,263, Cl. 427-53.100.
Gannon, Mark A.; and Yester, Francis R., Jr., 4,593,460, Cl. 29-602.00R.
Merritt, John W.; Wurzburg, Henry; and Kelley, Stephen H., 4,594,707, Cl. 370-91.000.
Townsend, Greg M.; and Henderson, James A., Jr., 4,594,633, Cl. 361-57.000.

Mourey, Bruno; and Hareng, Michel, to Thomson-CSF. Smectic liquid crystal color display screen. 4,593,978, Cl. 350-339.00F.

Mouri, Yasunori: *See*—
Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Osamu; and Hasegawa, Taiji, 4,593,663, Cl. 123-440.000.

MP Materials Corporation: *See*—
Jeppson, Morris R., 4,594,022, Cl. 404-28.000.

MTU Friedrichshafen GmbH: *See*—
Baring, Rolf; Rudert, Wolfgang; and Wolters, Gerd-Michael, 4,593,662, Cl. 123-198.00F.

MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Sohngen, Joachim, 4,594,053, Cl. 415-174.000.

Mudrinic, Ivica: *See*—
Romao, Nuno; and Mudrinic, Ivica, 4,594,609, Cl. 358-119.000.

Muesch, Herbert: *See*—
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,594,436, Cl. 549-359.000.

Mukai, Hiromu: *See*—
Kimura, Kazuo; Mukai, Hiromu; and Shibuya, Taro, 4,593,984, Cl. 354-219.000.

Mullan, Noel A.: *See*—
Newsome, Peter M.; Mullan, Noel A.; and Marshall, John P., 4,594,195, Cl. 558-412.000.

Muller, Norbert: *See*—
Peetz, Wolfgang; Klaissle, Siegfried; Moser, Bernhard; and Muller, Norbert, 4,594,033, Cl. 408-156.000.

Mullich, Richard O.: *See*—
Rotondi, Anthony J.; Mullich, Richard O.; and Carabet, George F., 4,593,542, Cl. 70-134.000.

Munavalli, Shekhar; and Poziomek, Edward J., to United States of America, Army. Preparation of N,N'-methylene-2,2'-azopyridocyanines. 4,594,413, Cl. 544-180.000.

Mundelius, Kevin G.; and Buddenbaum, Christian H. Secondary operations machine tool. 4,594,038, Cl. 409-205.000.

Munier, Philippe: *See*—
Lacoude, Michel; Lluansi, Michel; and Munier, Philippe, 4,594,115, Cl. 148-12.00B.

Murai, Koichi: *See*—
Kobayashi, Toshiaki; Terasawa, Shizuo; Akazome, Giichi; and Murai, Koichi, 4,594,167, Cl. 252-3.000.

Murakami, Katsuya: *See*—
Takuma, Toshiaki; Tsumura, Takayuki; Tsugiya, Takanori; Murakami, Katsuya; and Nakajima, Yasue, 4,594,449, Cl. 562-416.000.

Muralidhara, Ranya: *See*—
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,594,254, Cl. 426-535.000.

Muramatsu, Eiichi; Mathumoto, Sigemi; and Nagoshi, Fumiya, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin composition having toughness and high thermal deformation resistance. 4,594,387, Cl. 525-67.000.

Muramatsu, Takayoshi: *See*—
Shibata, Hirotaka; and Muramatsu, Takayoshi, 4,593,656, Cl. 123-52.00M.

Murasato, Shigeru: *See*—
Fujiwara, Kenzo; Takeuchi, Norio; Nakatsuka, Yoji; Horita, Tsuyoshi; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,522, Cl. 310-42.000.
Horita, Tsuyoshi; Nakatsuka, Yoji; Fujiwara, Kenzou; Takeuchi, Norio; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,523, Cl. 310-42.000.

Murase, Masao: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Murase, Masao; Inoue, Kichiro; and Shirahase, Ichiro, 4,594,345, Cl. 514-234.000.

Murata, Masanori: *See*—
Tomisawa, Yoshiaki; Kinoda, Seiji; Fujita, Eiji; Murata, Masanori; Takeuchi, Toshio; and Ogawa, Ken, 4,593,986, Cl. 354-324.000.

Muro, Toshihiko: *See*—
Kobayashi, Hiroshi; Yasunaga, Toshio; Muro, Toshihiko; Takeda, Fumio; and Tsuruta, Yutaka, 4,593,499, Cl. 52-126.600.

Murofushi, Satoru: *See*—
Endo, Takayoshi; Sugiyama, Toshimasa; Murofushi, Satoru; and Yagi, Sakai, 4,593,963, Cl. 339-97.00R.

Murphy, Betty J.: *See*—
Smith, James A.; and Murphy, Betty J., 4,594,362, Cl. 521-52.000.

Murphy, Mark J.: *See*—
Cochran, Steven M.; and Murphy, Mark J., 4,593,638, Cl. 114-39.000.

Murphy, Patrick J.: *See*—
Coursolle, Thomas P.; and Murphy, Patrick J., 4,594,504, Cl. 250-227.000.

Murray, Thomas K., III: *See*—
Antonie, Charles H.; and Murray, Thomas K., III, 4,593,820, Cl. 209-573.000.

Murren, Daniel J.: *See*—
Millhimes, Wayne L.; and Murren, Daniel J., 4,593,960, Cl. 339-42.000.

Musashi Co., Ltd.: *See*—
Kawano, Hikaru; Sato, Koji; and Nogi, Hiroyoshi, 4,594,043, Cl. 414-43.000.

Musser, John H.; and Kubrak, Dennis M., to American Home Products Corporation. Heterocyclic compounds as antiallergic agents. 4,594,425, Cl. 548-161.000.

Mutschler, Gunter: *See*—
Sinn, Hartmut; Breymaier, Hermann; and Mutschler, Gunter, 4,593,574, Cl. 74-198.000.

Muzzy, Kenneth R.: *See*—
Hogenhout, Franciscus, 4,594,036, Cl. 408-240.000.

Myers, Kenneth E.: *See*—
Spangler, Anthony G.; and Myers, Kenneth E., 4,593,430, Cl. 16-121.000.

Myers, Kimbrough I.; Blau, Carl C.; and Taylor, Richard P., to NCR Corporation. Automatically adjusting currency pusher plate apparatus. 4,593,895, Cl. 271-148.000.

Myers, Ricky W.: *See*—
Meray-Hovarth, Andrew G.; Myers, Ricky W.; and Palmberg, Robert A. A., 4,593,449, Cl. 29-527.100.

Mynderse, Jon S.; and Fukuda, David S., to Eli Lilly Company. Octahydroindolizinepropanoic acids and related compounds as enzyme inhibitors. 4,594,431, Cl. 546-138.000.

Naarden International N.V.: *See*—
Van Der Weerdt, Antonius J. A., 4,594,183, Cl. 252-522.00R.

Nachtkamp, Klaus: *See*—
Stahl, Hans-Georg; Schwindt, Jurgen; and Nachtkamp, Klaus, 4,594,374, Cl. 523-501.000.
Thoma, Wilhelm; Noll, Klaus; Nachtkamp, Klaus; Pedain, Josef; and Schroer, Walter, 4,594,385, Cl. 524-839.000.

Nagai, Hiroyuki; Nishihara, Minoru; and Shiota, Toshiaki, to Sumitomo Metal Industries, Ltd.; and Sumitomo Metal Chemical Co., Ltd. Metal-resin-metal sandwich laminates suitable for use in press forming. 4,594,292, Cl. 428-458.000.

Naganuma, Takeshi; Miyagawa, Natsumi; Ozawa, Toshiyuki; and Tamura, Kazutoshi, to Lion Corporation. Dentifrice composition. 4,594,242, Cl. 424-57.000.

Nagao, Taku: *See*—
Takeda, Mikio; Oh-ishi, Tokuro; Nakajima, Hiromichi; and Nagao, Taku, 4,594,342, Cl. 514-211.000.

Nagasaka, Hideki, to Mitsubishi Chemical Industries, Ltd. Photopolymerizable composition comprising tertiary aromatic amine and hexaarylbiimazole initiators. 4,594,310, Cl. 430-281.000.

Nagasaki, Fumihiko: *See*—
Ueda, Akiyoshi; Nagasaki, Fumihiko; Takakura, Yutaka; and Kojima, Shigeru, 4,594,429, Cl. 548-530.000.

Nagata, Masanori; Inoue, Toshiaki; and Hirayama, Mamoru, to Omron Tateisi Electronics Co. Credit transaction processing system. 4,594,663, Cl. 364-401.000.

Nagata, Masayoshi: *See*—
Horie, Seiji; Nagata, Masayoshi; Nakano, Junji; and Sato, Hideo, 4,594,303, Cl. 430-59.000.

Nagatomo, Hideaki; and Yasuda, Mitsuo, to Mitsubishi Denki Kabushiki Kaisha. Automobile ventilator. 4,593,609, Cl. 98-2.010.
Nagayasu, Koichi: *See*—
Shibue, Toshiaki; and Nagayasu, Koichi, 4,594,315, Cl. 430-531.000.
Nagoshi, Fumiya: *See*—
Muramatsu, Eiichi; Mathumoto, Sigemi; and Nagoshi, Fumiya, 4,594,387, Cl. 525-67.000.
Naka, Hiromitsu; Okushima, Takehiko; and Shoji, Tatsuo, to Kabushiki Kaisha Naka Gijutsu Kenkyusho. Access door. 4,593,493, Cl. 49-248.000.
Nakagaki, Kunihiro: *See*—
Harano, Fumio; Kaneta, Shigeyoshi; Nakagaki, Kunihiro; and Nishiyama, Satoshi, 4,594,124, Cl. 156-468.000.
Nakagawa, Hiroshi: *See*—
Miwa, Zenichiro; and Nakagawa, Hiroshi, 4,594,520, Cl. 310-12.000.
Nakagawa, Kazuyuki: *See*—
Ishikawa, Hiroshi; Uno, Tetsuyuki; Miyamoto, Hisashi; and Nakagawa, Kazuyuki, 4,594,347, Cl. 514-252.000.
Nakagawa, Mutuo; Ikkanzaka, Isao; and Uchida, Yasuyuki, to Kanai Juyo Kogyo Co., Ltd. Foundation for card clothing. 4,594,284, Cl. 428-234.000.
Nakajima, Hiromichi: *See*—
Takeda, Mikio; Oh-ishi, Tokuro; Nakajima, Hiromichi; and Nagao, Taku, 4,594,342, Cl. 514-211.000.
Nakajima, Yasue: *See*—
Takuma, Toshiaki; Tsumura, Takayuki; Tsugiya, Takanori; Murakami, Katsuya; and Nakajima, Yasue, 4,594,449, Cl. 562-416.000.
Nakajima, Zenji: *See*—
Okamoto, Shuichi; Kunihiro, Motoo; and Nakajima, Zenji, 4,593,891, Cl. 267-140.100.
Nakamoto, Yasunobu; Terayama, Toshiro; and Takayanagi, Mikio, to Kabushiki Kaisha Toshiba. Power plant. 4,593,527, Cl. 60-660.000.
Nakamura, Katsuya: *See*—
Nakayama, Akira; Nakamura, Katsuya; Hata, Kotaro; and Yamamoto, Makoto, 4,594,174, Cl. 252-62.540.
Nakamura, Koichi: *See*—
Nakamura, Taku; Hibino, Akira; Shibata, Takeshi; and Nakamura, Koichi, 4,594,308, Cl. 430-213.000.
Nakamura, Kunihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Stacking apparatus for paper sheets. 4,593,896, Cl. 271-186.000.
Nakamura, Masaru: *See*—
Saito, Yoshizi; Nakamura, Masaru; Iida, Toyoshi; and Honda, Tsugunori, 4,594,169, Cl. 252-8.50C.
Nakamura, Takato: *See*—
Iwata, Fumio; Nakamura, Takato; and Sakata, Tadakazu, 4,594,424, Cl. 548-127.000.
Nakamura, Taku; Hibino, Akira; Shibata, Takeshi; and Nakamura, Koichi, to Fuji Photo Film Co., Ltd. Photographic element comprising sulfinic acid/imidazole polymer mordant. 4,594,308, Cl. 430-213.000.
Nakamura, Yasuhiro: *See*—
Hayakawa, Yoshihiro; Nakamura, Yasuhiro; Tachita, Ryobun; and Yano, Tsutomu, 4,593,700, Cl. 128-663.000.
Nakanishi, Yuji: *See*—
Fujiwara, Kenzo; Takeuchi, Norio; Nakatsuka, Yoji; Horita, Tsuyoshi; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,522, Cl. 310-42.000.
Horita, Tsuyoshi; Nakatsuka, Yoji; Fujiwara, Kenzou; Takeuchi, Norio; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,523, Cl. 310-42.000.
Nakano, Junji: *See*—
Horie, Seiji; Nagata, Masayoshi; Nakano, Junji; and Sato, Hideo, 4,594,303, Cl. 430-59.000.
Nakano, Rieko: *See*—
Suzuki, Takashi; Kawakami, Takamasa; Koyama, Takeshi; Orisaku, Masami; Izaki, Kansei; Nakano, Rieko; and Mori, Akira, 4,594,330, Cl. 501-92.000.
Nakanome, Takemi: *See*—
Imaki, Naoshi; and Nakanome, Takemi, 4,594,438, Cl. 549-462.000.
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, to Electric Power Development Co., Ltd.; Kawasaki Jukogyo Kabushiki Kaisha; and Sumitomo Heavy Industries, Ltd. Preparation of deashed high solid concentration coal-water slurry. 4,593,859, Cl. 241-20.000.
Nakashima, Yoichi: *See*—
Iimura, Kenji; and Nakashima, Yoichi, 4,594,602, Cl. 357-13.000.
Nakashima, Yoshimoto: *See*—
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; Nakashima, Yoshimoto; and Sota, Kaoru, 4,594,197, Cl. 558-255.000.
Nakatsuka, Yoji: *See*—
Fujiwara, Kenzo; Takeuchi, Norio; Nakatsuka, Yoji; Horita, Tsuyoshi; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,522, Cl. 310-42.000.
Horita, Tsuyoshi; Nakatsuka, Yoji; Fujiwara, Kenzou; Takeuchi, Norio; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,523, Cl. 310-42.000.
Nakauchi, Jun; and Tahara, Yasuteru, to Mitsubishi Rayon Co., Ltd. Image-transmitting synthetic resin rod and a process for producing the same. 4,593,975, Cl. 350-96.340.
Nakayama, Akira; Nakamura, Katsuya; Hata, Kotaro; and Yamamoto, Makoto, to Nippon Zeon Co., Ltd. Magnetic paint for magnetic recording media. 4,594,174, Cl. 252-62.540.
Nakayama, Takashi: *See*—
Ishizuka, Yasuhiro; Nakayama, Takashi; and Yamagata, Seiichi, 4,593,522, Cl. 57-400.000.
Nakazono, Akiko: *See*—
Hashimoto, Tadanori; Yoshitake, Hiroshi; Yokoyama, Hiroyuki; and Nakazono, Akiko, 4,594,182, Cl. 252-518.000.
Nalco Chemical Company: *See*—
Roof, Glenn L.; Porlier, Beth W.; and Cravey, Wesley E., 4,594,147, Cl. 208-207.000.
Nara, Akio; Yazawa, Akio; and Akiyama, Yoshinori, to Nippondenso Co., Ltd. Fuel evaporator for internal combustion engine. 4,593,670, Cl. 123-545.000.
Narushima, Katsuya: *See*—
Ishimaru, Hajime; Narushima, Katsuya; and Momose, Takashi, 4,594,054, Cl. 417-49.000.
Nash, Ronald S.: *See*—
Burgess, W. D.; Lytton, Glenn E.; and Nash, Ronald S., 4,593,436, Cl. 19-105.000.
National Distillers and Chemical Corporation: *See*—
Cahill, Joseph, Jr.; and Harris, Eugene G., 4,594,434, Cl. 549-267.000.
Pritchett, Ervin G.; and Hoyt, John M., 4,594,393, Cl. 525-330.300.
National Instrument Company, Inc.: *See*—
Bergandy, Wieslaw, 4,593,720, Cl. 137-859.000.
National Research Development Corp.: *See*—
Dalton, Howard; Colby, John; and Stirling, David I., 4,594,324, Cl. 435-123.000.
Elliott, Michael; Janes, Norman F.; Elliott, Richard L.; Khambay, Bhupinder P. S.; and Pulman, David A., 4,594,355, Cl. 514-521.000.
Hamer, Arthur; and Pardoe, Beverley H., 4,594,636, Cl. 361-152.000.
Snook, Martin; Rideout, James M.; and Renshaw, Alan, 4,594,533, Cl. 315-363.000.
Natov, Miltcho A.; Vassileva, Stefanka V.; Kotchev, Hristo B.; Djagarov, Zvetan S.; and Popov, Nikola N., to Vish Chimiko-Technologitcheski Institute. Polyvinyl chloride composition. 4,594,372, Cl. 523-208.000.
Natsume, Kazuyuki; Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Vehicle height control system. 4,593,920, Cl. 280-6.00R.
Natsume, Toshio: *See*—
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,594,101, Cl. 75-0.50C.
Nauman, E. Bruce, to Rensselaer Polytechnic Institute. Fine particle dispersions of incompatible polymers in polymer matrices. 4,594,371, Cl. 523-340.000.
Nausedas, Joseph A., to Union Carbide Corporation. Stuffing apparatus and method. 4,593,433, Cl. 17-49.000.
NCR Corporation: *See*—
Avery, James M.; and Hoyer, Elmer A., 4,594,575, Cl. 340-347.0AD.
Myers, Kimbrough I.; Blau, Carl C.; and Taylor, Richard P., 4,593,895, Cl. 271-148.000.
Rhoads, Paul M.; and Renkes, Arthur H., 4,594,649, Cl. 363-56.000.
NEC Corporation: *See*—
Araki, Shigeru; and Kato, Hideaki, 4,594,526, Cl. 310-317.000.
Goto, Hideto; and Amano, Haruo, 4,594,606, Cl. 357-68.000.
Inoue, Tatsuo; and Kimura, Mitsuru, 4,594,473, Cl. 174-68.500.
Kobayashi, Kazutomo, 4,594,706, Cl. 370-89.000.
Tsuji, Yoshitake, 4,594,732, Cl. 382-9.000.
Yasue, Kazuo, 4,594,709, Cl. 371-8.000.
Necoechea, R. Warren, to Fairchild Camera and Instrument Corporation. Participate register for parallel loading pin-oriented registers in test equipment. 4,594,544, Cl. 324-73.0AT.
Nelle, Guenther, to Dr. Johannes Heidenhain GmbH. Encapsulated measuring system. 4,593,471, Cl. 33-125.00T.
Nelson, Donald L.; and Lamont, Mary J., to Dow Chemical Company, The. Vinyl ester resins from glycidyl ethers of reaction product of a phenol and unsaturated hydrocarbons. 4,594,398, Cl. 525-531.000.
Nelson, Jack, to Wems/International Controls, Inc. Expanded-capacity wireless security system with dual-range environmental monitoring and control. 4,594,580, Cl. 340-521.000.
Nelson, Ralph E., to Winfield Corp. Portable hamper with foot pedal operated cover. 4,593,873, Cl. 248-98.000.
Nelson, Richard P. Portable lifting, loading and transporting device. 4,593,883, Cl. 254-7.00B.
Nemoto, Shoji; and Yoshioka, Hiroshi, to Sony Corporation. Still image reproducing apparatus. 4,594,615, Cl. 360-10.200.
Nenadal, Arthur F., to Warner & Swasey Company, The. Machine tool utilizing force transmitting joints. 4,593,587, Cl. 82-32.000.
Ness, Joseph M.; and Gerads, Lyle J., to Helland Research & Engineering, Inc. Torque release drive connector. 4,593,800, Cl. 192-56.00R.
Nestec S.A.: *See*—
Dieffenbacher, Albrecht, 4,594,194, Cl. 260-428.000.
Neuhaus, Detlev; Hesse, Karl-Heinz; Ruhnau, Gerhard; and Liermann, Peter, to WABCO Fahrzeugbremsen GmbH. Multiplex cabling system for vehicles. 4,594,571, Cl. 340-52.00F.
Neutrik Aktiengesellschaft: *See*—
Weingartner, Bernhard, 4,594,729, Cl. 381-18.000.
Neuweg Fertigung GmbH: *See*—
Sinn, Hartmut; Breymaier, Hermann; and Mutschler, Gunter, 4,593,574, Cl. 74-198.000.

Neves, Billy W., to Eckel Manufacturing Co., Inc. Power tongs with improved hydraulic drive. 4,593,584, Cl. 81-57.180.
New Japan Chemical Co., Ltd.: *See—*
Kobayashi, Toshiaki; Terasawa, Shizuo; Akazome, Giichi; and Murai, Koichi, 4,594,167, Cl. 252-3.000.
Newsome, Peter M.; Mullan, Noel A.; and Marshall, John P., to Beecham Group p.l.c. 6,7,7,8-tetrahydro-nathonitrile intermediates. 4,594,195, Cl. 558-412.000.
Newsome, R. Wayne. Pre-fabricated and modular chimney facade system. 4,593,510, Cl. 52-314.000.
NGK Spark Plug Co., Ltd.: *See—*
Asayama, Yoshiaki; Yamada, Tetsusyo; and Hirate, Shintaro, 4,594,139, Cl. 204-410.000.
Nichols, Jack E., to Boeing Company, The. On-board tail jack assembly. 4,593,871, Cl. 244-129.100.
Nicholson, Myron D., to Union Carbide Corporation. Preparation of tar-depleted liquid smoke treated casings. 4,594,251, Cl. 426-262.000.
Nicolet Instrument Corporation: *See—*
Ghaderi, Sahba, 4,594,506, Cl. 250-288.000.
Niebylski, Leonard M.: *See—*
Zaweski, Edward F.; and Niebylski, Leonard M., 4,594,077, Cl. 44-57.000.
Nielsen, Herman T.: *See—*
Van Hatten, David A.; and Nielsen, Herman T., 4,594,590, Cl. 340-825.510.
Niemczyk, Michael J., to Quaker Oats Company, The. Method for making dipeptide sweetened ready-to-eat cereal. 4,594,252, Cl. 426-307.000.
Nihon Radiator Co., Ltd.: *See—*
Tajima, Katsuichirou; and Matsuda, Kosei, 4,593,852, Cl. 237-12.30A.
Nikodem, Leslie F.: *See—*
Hackman, Donald J.; Caudy, Don W.; and Nikodem, Leslie F., 4,593,885, Cl. 254-277.000.
Nippon Electric Co., Ltd.: *See—*
Iwashita, Masao; and Tenma, Tsutomu, 4,594,653, Cl. 364-200.000.
Nohmi, Hitoshi, 4,594,593, Cl. 343-5.0CM.
Uno, Takashi, 4,594,688, Cl. 365-95.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Bellini, Mario, 4,593,593, Cl. 84-177.000.
Tachida, Hiroki; Sato, Takane; and Sato, Shigeaki, 4,593,594, Cl. 84-185.000.
Tomisawa, Norio; and Aoshima, Shinji, 4,594,703, Cl. 369-59.000.
Nippon Kayaku Kabushiki Kaisha: *See—*
Kawata, Terushige; and Yamashita, Shinsuke, 4,594,240, Cl. 424-28.000.
Yamada, Osamu; Yanagi, Mikio; Futatsuya, Fumio; and Kobayashi, Kenji, 4,594,099, Cl. 71-96.000.
Nippon Oil Co., Ltd.: *See—*
Kawabata, Nobuaki, 4,594,109, Cl. 106-271.000.
Nippon Piston Ring Co., Ltd.: *See—*
Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,594,062, Cl. 418-173.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Saito, Naoki, 4,593,780, Cl. 180-79.100.
Nippon Sheet Glass Co., Ltd.: *See—*
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,594,379, Cl. 524-114.000.
Nippon Shinyaku Co. Ltd.: *See—*
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Murase, Masao; Inoue, Kichiro; and Shirahase, Ichiro, 4,594,345, Cl. 514-234.000.
Nippon Soda Co. Ltd.: *See—*
Ueda, Akiyoshi; Nagasaki, Fumihiko; Takakura, Yutaka; and Kojima, Shigeru, 4,594,429, Cl. 548-530.000.
Nippon Soken, Inc.: *See—*
Tanaka, Katsuyuki; Kimura, Yasuhiro; Kato, Masanori; and Kuwakado, Satosi, 4,594,694, Cl. 367-120.000.
Nippon Telegraph & Telephone Corporation: *See—*
Kaneko, Takao; Yamauchi, Hironori; and Iwata, Atsushi, 4,594,687, Cl. 364-900.000.
Nippon Telegraph & Telephone Hitachi Ltd & Public Corporation: *See—*
Kanzaki, Minoru; Komiya, Kazumi; Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, 4,594,733, Cl. 382-50.000.
Nippon Thompson Co., Ltd.: *See—*
Hidano, Kengo, 4,593,957, Cl. 384-49.000.
Nippon Zeon Co., Ltd.: *See—*
Nakayama, Akira; Nakamura, Katsuya; Hata, Kotaro; and Yamamoto, Makoto, 4,594,174, Cl. 252-62.540.
Nippondenso Co., Ltd.: *See—*
Nara, Akio; Yazawa, Akio; and Akiyama, Yoshinori, 4,593,670, Cl. 123-545.000.
Natsume, Kazuyuki; Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, 4,593,920, Cl. 280-6.00R.
Omori, Toshihiko; Sakakibara, Shuzi; Kato, Masaaki; and Masuda, Akira, 4,593,664, Cl. 123-446.000.
Yoshino, Muneki; and Tanahashi, Toshitaka, 4,594,573, Cl. 340-62.000.
Niquel, Maurice; Gourdon, Claude; and Rouxel, Jean, to Lignes Telegraphiques et Telephoniques LTT. Synchronization device for digital frame transmission. 4,594,728, Cl. 375-116.000.
Nishida, Kozi: *See—*
Yamamoto, Takashi; Nishida, Kozi; and Tateishi, Akio, 4,593,974, Cl. 350-96.340.
Nishihara, Minoru: *See—*
Nagai, Hiroyuki; Nishihara, Minoru; and Shiota, Toshiaki, 4,594,292, Cl. 428-458.000.
Nishimura, Akira: *See—*
Osawa, Yoshitaka; Nishimura, Akira; Morimi, Junki; and Tobe, Mitsunobu, 4,594,285, Cl. 428-240.000.
Nishino, Hiroshi; and Aibe, Toshio, to Takeda Chemical Industries, Ltd. Method for removal of poisonous gases. 4,594,231, Cl. 423-210.000.
Nishiyama, Satoshi: *See—*
Harano, Fumio; Kaneta, Shigeyoshi; Nakagaki, Kunihiro; and Nishiyama, Satoshi, 4,594,124, Cl. 156-468.000.
Niskanen, Toivo, to A. Ahlstrom Osakeyhtio. Centrifugal pump for liquids containing solid material. 4,594,052, Cl. 415-121.00B.
Niskin, Shale J. Water sampler device with key. 4,593,570, Cl. 73-864.670.
Nissan Motor Company, Limited: *See—*
Fukuhara, Hiroshige, 4,594,594, Cl. 343-389.000.
Hosaka, Akio, 4,594,669, Cl. 364-431.050.
Kinoshita, Satoshi, 4,593,577, Cl. 74-493.000.
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,594,583, Cl. 340-576.000.
Yasuhara, Seishi, 4,594,667, Cl. 364-431.060.
Nisshin Steel Co., Ltd.: *See—*
Maruhashi, Shigeaki; Hoshino, Kazuo; Uematsu, Yoshihiro; Miyakusu, Katsuhisa; and Fujimura, Takehiko, 4,594,114, Cl. 148-12.0EA.
Nitta, Tsuneharu: *See—*
Fukushima, Fumio; Terada, Jiro; and Nitta, Tsuneharu, 4,594,569, Cl. 338-35.000.
Nitto Boseki Co., Ltd.: *See—*
Hayashi, Ikuo; Itikawa, Tadao; and Shimizu, Kiyoshi, 4,594,409, Cl. 528-328.000.
Nitto Electric Industrial Co., Ltd.: *See—*
Satoh, Susumu; Kobayashi, Ichiro; Takakura, Yumiko; and Tamada, Mitsuru, 4,594,243, Cl. 424-78.000.
Niwano, Kazuhisa: *See—*
Tanaka, Minoru; Niwano, Kazuhisa; Minato, Tetsunori; and Oka, Yastami, 4,594,106, Cl. 106-1.120.
Nixon, Michael T. Acoustical panels. 4,594,278, Cl. 428-68.000.
NL Industries, Inc.: *See—*
Barr, John D., 4,593,777, Cl. 175-379.000.
NL Sperry-Sun of Canada, Ltd.: *See—*
Comeau, Laurier J., 4,593,771, Cl. 175-48.000.
Nobusawa, Hiroshi; Hosoya, Eiji; Imaizumi, Masahiro; and Takasu, Hitoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Shaft drive apparatus for motor vehicles. 4,593,782, Cl. 180-88.000.
Noda, Kazushi, to Toyoda Gosei Co., Ltd. Steering wheel provided with horn switch. 4,594,486, Cl. 200-61.540.
Nogi, Hiroyoshi: *See—*
Kawano, Hikaru; Sato, Koji; and Nogi, Hiroyoshi, 4,594,043, Cl. 414-43.000.
Noguchi, Kiyoshi; Kobayashi, Kouji; and Takayama, Suguru, to TDK Corporation. Magnetic recording medium. 4,594,296, Cl. 428-610.000.
Noguchi, Takaharu; Yamazaki, Shigeru; and Arai, Takao, to Hitachi, Ltd. Rotary head type digital information signal recording and reproducing apparatus and tracking control method therein. 4,594,621, Cl. 360-77.000.
Nohmi Bosai Kogyo Co. Ltd.: *See—*
Matoba, Kiyoshi, 4,594,581, Cl. 340-531.000.
Sasaki, Toru, 4,594,512, Cl. 250-384.000.
Nohmi, Hitoshi, to Nippon Electric Co., Ltd. Synthetic aperture radar image processing system. 4,594,593, Cl. 343-5.0CM.
Noirot, Tamarra J., to AT&T Technologies, Inc. PBX equipment with dial signal modification. 4,594,477, Cl. 179-18.0AD.
Noll, Klaus: *See—*
Thoma, Wilhelm; Noll, Klaus; Nachtkamp, Klaus; Pedain, Josef; and Schroer, Walter, 4,594,385, Cl. 524-839.000.
Nomura, Tadatoshi: *See—*
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Murase, Masao; Inoue, Kichiro; and Shirahase, Ichiro, 4,594,345, Cl. 514-234.000.
Normalair-Garrett Holdings Ltd.: *See—*
Tremain, J. Keith; and Taylor, James C., 4,594,080, Cl. 55-179.000.
Norris, Robert D.: *See—*
Brown, Richard A.; Norris, Robert D.; and Richards, Joseph C., 4,594,170, Cl. 252-8.55R.
North American Philips Corporation: *See—*
Scholten, Pieter C.; Snyder, Fred W.; and Sorkin, Howard, 4,594,271, Cl. 427-221.000.
Northern Telecom Limited: *See—*
Gumb, Beverley W.; Freeman, Raymond C.; and Busche, Alan C., 4,594,478, Cl. 179-103.000.
Scheithauer, Eric A.; and Jaycox, Donald F., 4,594,635, Cl. 361-119.000.
Nudenberg, Walter: *See—*
Loveless, Frederick C.; Merijanian, Aspet V.; Smudin, David J.; and Nudenberg, Walter, 4,594,469, Cl. 585-511.000.
Nunno, Louis E. Ski pole wrist strap and seat assembly. 4,593,933, Cl. 280-812.000.
Nuovo Pignone S.p.A.: *See—*
Ferrari Aggradi, Gian P.; and Bonfiglioli, Giampaolo, 4,593,448, Cl. 29-523.000.
Ferrari Aggradi, Gian P.; and Bonfiglioli, Giampaolo, 4,593,917, Cl. 277-30.000.

Nussbaum, Theodore W.: *See—*
Cox, Percy T.; Warren, Wayne F.; and Nussbaum, Theodore W., 4,594,551, Cl. 324-341.000.

Nyilas, Emery; and Chiu, Tin-Ho, to Allied Corporation. Prosthetic devices derived from krebs-cycle dicarboxylic acids and diols. 4,594,407, Cl. 528-272.000.

Obara, Hideo: *See—*
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,594,583, Cl. 340-576.000.

Obara, Toshio: *See—*
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Gonda, Michihiro; Kanasugi, Mikiko; and Obara, Toshio, 4,594,601, Cl. 346-221.000.

Oberbach, Manfred; and Keisers, Laurenz, to Didier-Werke AG. Apparatus for replaceably connecting a casting tube to a closable pouring spout of a tundish. 4,593,838, Cl. 222-607.000.

Oberhoff, Dietmar: *See—*
Isselstein, Fritz; Luhn, Ernst; Coen, Gunther; Oberhoff, Dietmar; and Keck, Roland, 4,593,567, Cl. 73-643.000.

Oblizajek, Kenneth L.; Lauer, Cornelius; and Culp, Eugene H., to Uniroyal Tire Company, Inc. Tire testing apparatus. 4,593,557, Cl. 73-146.000.

O'Brien, William J. Electric knife. 4,593,466, Cl. 30-272.00A.

Ochiai, Izumi: *See—*
Itoh, Masaaki; Kogure, Hiroshi; Iino, Kenji; Ochiai, Izumi; Kitayama, Yukio; and Miyagi, Masahiro, 4,593,756, Cl. 165-151.000.

O'Connell, Gregory S.: *See—*
Hoenig, Stephen M.; Flores, David P.; and O'Connell, Gregory S., 4,594,382, Cl. 524-400.000.

O'Dell, David L.; and Diehn, Philip H., to Wheelabrator-Frye Inc. Abrasive seal recovery system. 4,593,497, Cl. 51-424.000.

Odobasic, Steven L. Laminated tubular link. 4,593,889, Cl. 267-57.10A.

Oettinghaus, Dieter: *See—*
Hubner, Klaus-Dieter; Oettinghaus, Dieter; and Stanek, Wolfram, 4,594,568, Cl. 335-289.000.

Ogata, Hisanao: *See—*
Kikkawa, Seiichi; Ogata, Hisanao; Hakuraku, Yoshinori; Mase, Masahiro; Tsumaki, Nobuo; Awada, Yoshihisa; and Kajiwara, Hiroki, 4,593,835, Cl. 222-131.000.

Ogawa, Ken: *See—*
Tomisawa, Yoshiaki; Kinoda, Seiji; Fujita, Eiji; Murata, Masanori; Takeuchi, Toshio; and Ogawa, Ken, 4,593,986, Cl. 354-324.000.

Oger, Jacques: *See—*
Hauer, Jean-Claude; and Oger, Jacques, 4,594,026, Cl. 405-153.000.

Oguchi, Tomihiro: *See—*
Sugibayashi, Kiyoshi; Oguchi, Tomihiro; and Takahori, Hiroyuki, 4,594,611, Cl. 358-191.100.

Oh-ishi, Tokuro: *See—*
Takeda, Mikio; Oh-ishi, Tokuro; Nakajima, Hiromichi; and Nagao, Taku, 4,594,342, Cl. 514-211.000.

Ohba, Toshihiro; Kinoshita, Hiroshi; Kanatani, Yoshiharu; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Method and circuit for driving electroluminescent display panels with a stepwise driving voltage. 4,594,589, Cl. 340-805.000.

Ohigashi, Toshihide, to Kuraray Co., Ltd. Shoemaking material and production thereof. 4,594,283, Cl. 428-218.000.

Ohmi, Kyozo: *See—*
Baba, Takeshi; Iwasa, Hiroki; and Ohmi, Kyozo, 4,593,953, Cl. 301-6.0CS.

Ohsaki, Kozo; Zanma, Jun; and Watanabe, Hiroshi, to Toyo Engineering Corporation. Reaction method and reactor therefor. 4,594,227, Cl. 422-148.000.

Ohta, Tomozo, to Sharp Kabushiki Kaisha. Demodulation circuit from FM signals and demodulation system therefor. 4,594,556, Cl. 329-137.000.

Ohtani, Noboru: *See—*
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,594,379, Cl. 524-114.000.

Ohtani, Takayuki; and Iizuka, Tetsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Low power consumption, high speed CMOS signal input circuit. 4,594,519, Cl. 307-443.000.

Oka, Yastami: *See—*
Tanaka, Minoru; Niwano, Kazuhisa; Minato, Tetsunori; and Oka, Yastami, 4,594,106, Cl. 106-1.120.

Okabe, Kazuo: *See—*
Hagiwara, Satoru; Ishizuka, Ichiro; and Okabe, Kazuo, 4,594,203, Cl. 264-22.000.

Okada, Tomoo: *See—*
Ikeda, Tadaaki; Kitamura, Masakazu; and Okada, Tomoo, 4,593,535, Cl. 62-217.000.

Okajima, Takahiro: *See—*
Takahashi, Hideyuki; Kenmotsu, Isami; Okajima, Takahiro; and Takahashi, Yoshio, 4,594,700, Cl. 369-39.000.

Okamoto, Shuichi; Kunihiro, Motoo; and Nakajima, Zenji, to Kaisha Toyota Jidosha Kabushiki; and Toyo Rubber Industry Co., LTd., The. Vibration-absorbing mounting device with hydraulic damping, especially for engines. 4,593,891, Cl. 267-140.100.

Okaniwa, Kenichiro; Kikugawa, Shozo; and Koyama, Mikio, to Konishiroku Photo Industry Co., Ltd. Analytical element. 4,594,224, Cl. 422-56.000.

Okaniwa, Kenichiro: *See—*
Arai, Kazumi; Koyama, Mikio; and Okaniwa, Kenichiro, 4,594,225, Cl. 422-56.000.

Okayama, Junji: *See—*
Ishida, Kozo; Okayama, Junji; and Otsuki, Kunio, 4,594,004, Cl. 356-433.000.

Okumura, Fumio: *See—*
Miyauchi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,594,269, Cl. 427-150.000.

Okushima, Takehiko: *See—*
Naka, Hiromitsu; Okushima, Takehiko; and Shoji, Tatsuo, 4,593,493, Cl. 49-248.000.

Olin Corporation: *See—*
Caron, Ronald N.; and Breedis, John F., 4,594,221, Cl. 420-485.000.
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,594,117, Cl. 148-414.000.

Olivier, Errol J., to Copolymer Rubber & Chemical Corporation. Polyamide grafted EPM blend. 4,594,386, Cl. 525-66.000.

Ollivier, Yves, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Spare subscriber terminal device in a digital concentrator. 4,594,704, Cl. 370-16.000.

Olympus Optical Co., Ltd.: *See—*
Kubokawa, Hiroaki, 4,593,680, Cl. 128-4.000.

Omitsu, Takashi, to Aisin Seiki Kabushiki Kaisha. Microprocessor controlled system and method for increasing the fuel flow to the prime mover of a power delivery system having a continuously variable ratio transmission upon a commanded increase in power delivery. 4,593,581, Cl. 74-866.000.

Omori, Toshihiko; Sakakibara, Shuzi; Kato, Masaaki; and Masuda, Akira, to Nippondenso Co., Ltd. Fuel injection apparatus. 4,593,664, Cl. 123-446.000.

Omron Tateisi Electronics Co.: *See—*
Nagata, Masanori; Inoue, Toshiaki; and Hirayama, Mamoru, 4,594,663, Cl. 364-401.000.

Omura, Satoshi; and Tsuzuki, Kazuo. Thioether derivatives of tylosin. 4,594,338, Cl. 514-30.000.

O'Neill, Raymond J. Breakwater construction element. 4,594,023, Cl. 405-29.000.

Ono, Kenzi; and Ozawa, Toshiyuki, to Toyota Jidosha Kabushiki Kaisha. Construction of door glass guide in motor vehicle door. 4,593,494, Cl. 49-374.000.

Ono, Kimizo: *See—*
Yoshida, Kenichi; Ono, Kimizo; and Tsuno, Koichi, 4,593,973, Cl. 350-96.290.

Oohashi, Kaoru: *See—*
Natsume, Kazuyuki; Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, 4,593,920, Cl. 280-6.00R.

Ooka, Naoto: *See—*
Natsume, Kazuyuki; Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, 4,593,920, Cl. 280-6.00R.

Oouchi, Kei: *See—*
Shimizu, Yukiaki; and Oouchi, Kei, 4,593,625, Cl. 105-182.00R.

Opel, George E. Universal credit card. 4,593,936, Cl. 283-112.000.

Optical Storage International-U.S.: *See—*
Bracht, Roger R.; and Silvey, Dorrel R., 4,594,717, Cl. 372-38.000.

Orban, Ivan, to Ciba-Geigy Corporation. Process for the preparation of sterically hindered hydroxyphenylcarboxylic acid esters. 4,594,444, Cl. 560-067.000.

Orisaku, Masami: *See—*
Suzuki, Takashi; Kawakami, Takamasa; Koyama, Takeshi; Orisaku, Masami; Izaki, Kansei; Nakano, Rieko; and Mori, Akira, 4,594,330, Cl. 501-92.000.

Ortolivo, Thomas V. Waterproof scouring glove. 4,593,427, Cl. 15-227.000.

Orvik, Jon A., to Dow Chemical Company, The. Selective halogenation of 6-hydroxy picoline derivatives. 4,594,422, Cl. 546-303.000.

Osaka Chemical Laboratory Co., Ltd.: *See—*
Kitagawa, Isao, 4,594,412, Cl. 536-18.500.

Osaka Gas Company: *See—*
Yamamoto, Mitsuo; Kinumoto, Namio; Tsuji, Toshinori; and Hiraoka, Tutomu, 4,593,722, Cl. 138-145.000.

Osawa, Yoshitaka; Nishimura, Akira; Morimi, Junki; and Tobe, Mitsunobu, to Sumitomo Electric Industries, Ltd. Flexible membrane material. 4,594,285, Cl. 428-240.000.

Ose, Earl E.; and Turner, Jan R., to Eli Lilly and Company. Methods of controlling mycoplasma infections. 4,594,337, Cl. 514-30.000.

Oshlag, David A.: *See—*
Dyke, Denis G.; and Oshlag, David A., 4,594,223, Cl. 422-56.000.

Osrodek Badawczo-Rozwojowy Techniki Medycznej "Ormed": *See—*
Kepski, Roman; Walczak, Franciszek; Plucinski, Zbigniew; and Piatkowski, Adam, 4,593,702, Cl. 128-696.000.

Osterloh, Rolf: *See—*
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,594,136, Cl. 204-181.700.

Oszut, Mumin. Processing machine for surface treatment. 4,593,579, Cl. 74-571.00R.

Othen, David G., to British Petroleum Company p.l.c., The. Process for producing corrosion inhibiting particles. 4,594,369, Cl. 523-200.000.

Otis Elevator Company: *See—*
Salmon, John K., 4,593,793, Cl. 187-56.000.
Tweed, George C., Jr.; and McCarthy, Richard C., 4,594,570, Cl. 340-21.000.

Otsu, Akihiko: *See—*
Kamono, Takashi; and Otsu, Akihiko, 4,593,463, Cl. 29-884.000.

Otsuka Pharmaceutical Co. Limited: *See—*
Ishikawa, Hiroshi; Uno, Tetsuyuki; Miyamoto, Hisashi; and Nakagawa, Kazuyuki, 4,594,347, Cl. 514-252.000.

Otsuki, Kunio: *See—*
Ishida, Kozo; Okayama, Junji; and Otsuki, Kunio, 4,594,004, Cl. 356-433.000.

Otto, William L., Jr.; Lawson, Neal L.; and Kuhn, Howard A., to Aluminum Company of America. Rolling procedures for alligator defect elimination. 4,593,551, Cl. 72-240.000.

Outboard Marine Corporation: *See*—
VanRens, Russell J.; and Bailey, Frank V., 4,593,739, Cl. 164-34.000.

Overton, James R.: *See*—
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,594,445, Cl. 560-103.000.

Owens, Jeffrey, to General Signal Corporation. Watchdog timer. 4,594,685, Cl. 364-900.000.

Oy Partek AB: *See*—
Hakasaari, Tapio K., 4,593,511, Cl. 52-404.000.

Oyama, Kiyotaka; and Harada, Tuneo, to Toyo Soda Manufacturing Co., Ltd. Process for producing an α-halogeno-β-phenylpropionic acid. 4,594,450, Cl. 562-496.000.

Oyo Corporation: *See*—
Hefer, Fred W., 4,594,698, Cl. 367-188.000.

Ozaki, Nobuo, to Maeda Industries, Ltd. One way clutch mechanism for bicycle freewheel hub. 4,593,799, Cl. 192-46.000.

Ozawa Concrete Industry Co., Ltd.: *See*—
Suzuki, Osamu; Ishizaki, Kanjiro; and Ozawa, Seiichi, 4,594,513, Cl. 250-506.100.

Ozawa, Seiichi: *See*—
Suzuki, Osamu; Ishizaki, Kanjiro; and Ozawa, Seiichi, 4,594,513, Cl. 250-506.100.

Ozawa, Toshikazu: *See*—
Aoi, Kazuo; and Ozawa, Toshikazu, 4,593,657, Cl. 123-90.600.

Ozawa, Toshiyuki: *See*—
Naganuma, Takeshi; Miyagawa, Natsumi; Ozawa, Toshiyuki; and Tamura, Kazutoshi, 4,594,242, Cl. 424-57.000.
Ono, Kenzi; and Ozawa, Toshiyuki, 4,593,494, Cl. 49-374.000.

P. A. Terry Limited: *See*—
Terry, Edmund A.; Burger, Albert J.; and Terry, Peter A., 4,593,545, Cl. 70-269.000.

Pace, James: *See*—
Rivas, Andrew; Rivas, Robert; Pace, James; and Cavanaugh, Timothy, 4,593,912, Cl. 273-339.000.

Pacht, Amos, to Butterworth, Inc. Fail-safe high pressure fluid delivery system. 4,593,858, Cl. 239-126.000.

Padfield, John M.; and Groom, Cheryl V., to Glaxo Group Limited. Pharmaceutical compositions. 4,594,359, Cl. 514-647.000.

Paek, Un-Chul; and Schroeder, Charles M., to AT&T Technologies, Inc. Method and apparatus for making, coating and cooling light-guide fiber. 4,594,088, Cl. 65-3.400.

Paetsch, Juergen: *See*—
Merger, Franz; Hettinger, Peter; Hupfer, Leopold; and Paetsch, Juergen, 4,594,461, Cl. 568-853.000.

Painter, Robert A., to Electronic Instrument & Specialty Corp. Electrical component encapsulation package. 4,594,644, Cl. 361-417.000.

Pall Corporation: *See*—
Pall, David B.; Harwood, Colin F.; Bradley, Arthur; and Brennan, Timothy R., 4,594,202, Cl. 264-8.000.

Pall, David B.; Harwood, Colin F.; Bradley, Arthur; and Brennan, Timothy R., to Pall Corporation. Method of making cylindrical fibrous filter structures. 4,594,202, Cl. 264-8.000.

Palmberg, Robert A. A.: *See*—
Meray-Hovarth, Andrew G.; Myers, Ricky W.; and Palmberg, Robert A. A., 4,593,449, Cl. 29-527.100.

Pankowiecki, Joseph, to Westinghouse Electric Corp. Steam turbine system installation with protection of piping against seismic loading. 4,593,526, Cl. 60-657.000.

Pann, Keh; and Fields, Jerry L., to Mobil Oil Corporation. Seismic trace interpolation using f-k filtering. 4,594,693, Cl. 367-43.000.

Panson, Armand J.; and Troy, Michael, to Westinghouse Electric Corp. Augmented high gradient magnetic filter. 4,594,215, Cl. 376-315.000.

Papp, John G.: *See*—
Hostatter, Alfred F.; Lichti, Wayne P.; and Papp, John G., 4,594,219, Cl. 419-8.000.

Pappalardo, Romano G.; and Walsh, John, to GTE Laboratories Incorporated. Process for producing a yellow emitting phosphor. 4,594,178, Cl. 252-301.40P.

Pardoe, Beverley H.: *See*—
Hamer, Arthur; and Pardoe, Beverley H., 4,594,636, Cl. 361-152.000.

Parini, Ettore: *See*—
Giani, Roberto; Parini, Ettore; and Tonon, Giancarlo, 4,594,190, Cl. 260-239.30R.

Paris, Jean, to Salomon S.A. Tightening and closure apparatus for ski boot. 4,593,483, Cl. 36-119.000.

Park, George B.: *See*—
Cook, John A.; Park, George B.; and McLoughlin, Robert H., 4,594,299, Cl. 429-129.000.

Parker, Tony E.: *See*—
Moore, Victor S.; Veneski, Gerard A.; Parker, Tony E.; Rhodes, Joseph C., Jr.; Kraft, Wayne R.; and Stahl, William L., Jr., 4,594,661, Cl. 364-200.000.

Parrish, Roger W. Process for manufacture of ammonia. 4,594,233, Cl. 423-359.000.

Particle Measuring Systems, Inc.: *See*—
Knollenberg, Robert G., 4,594,715, Cl. 372-32.000.

Partridge, John J.; Shiuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. 25,26-dehydro-1α,24R-dihydroxycholecalciferol and 25,26-dehydro-1α,24S-dihydroxycholecalciferol and the epimeric mixture. 4,594,340, Cl. 514-167.000.

Pascouet, Adrien P. Pneumatically-operated liquid slug projector apparatus. 4,594,697, Cl. 367-146.000.

Paspek, Stephen C., Jr.; and Coker, Curtis D., to Standard Oil Company, The. Conversion of high boiling organic materials to low boiling materials. 4,594,141, Cl. 208-390.000.

Paspek, Stephen C., Jr.: *See*—
Lambert, Joseph M., Jr.; and Paspek, Stephen C., Jr., 4,594,228, Cl. 422-218.000.

Paszner, Laszlo: *See*—
Chang, Pei-Ching; and Paszner, Laszlo, 4,594,130, Cl. 162-16.000.

Patchett, Arthur A.: *See*—
Cheung, Yak-Fa; Thorsett, Eugene D.; and Patchett, Arthur A., 4,594,341, Cl. 514-211.000.

Patel, Chandrakant B., to RCA Corporation. Camera zoom compensator for television stereo audio. 4,594,610, Cl. 358-144.000.

Patterson, Dennis R., to Rohm and Haas Company. Process for preparing 3'-halodiphenylethers. 4,594,133, Cl. 204-158.100.

Paul Wurth S.A.: *See*—
Chunshan, Pan, 4,593,751, Cl. 165-9.100.
Ulveling, Leon, 4,593,727, Cl. 141-5.000.
Ulveling, Leon, 4,594,028, Cl. 406-30.000.

Paulson, Gary F.: *See*—
Sandberg, Christopher T.; and Paulson, Gary F., 4,593,431, Cl. 16-381.000.

Paust, Joachim: *See*—
Schaefer-Luederssen, Ulrich; Jaedicke, Hagen; Paust, Joachim; and Eggersdorfer, Manfred, 4,594,456, Cl. 568-447.000.

Pavlista, Alexander D.: *See*—
Speltz, Laurine M.; Walworth, Bryant L.; and Pavlista, Alexander D., 4,594,092, Cl. 71-77.000.

Pawloski, Chester E.; and Ginter, Sally P., to Dow Chemical Company, The. Halogenated phosphorus hydroxy-alkyl and t-alkoxyalkyl esters. 4,594,364, Cl. 521-85.000.

Payton, Hugh W. Apparatus for the delivery of oxygen or the like. 4,593,688, Cl. 128-200.280.

Peat, Thomas S.: *See*—
Telford, David W.; and Peat, Thomas S., 4,593,568, Cl. 73-623.000.

Pedain, Josef: *See*—
Thoma, Wilhelm; Noll, Klaus; Nachtkamp, Klaus; Pedain, Josef; and Schroer, Walter, 4,594,385, Cl. 524-839.000.

Pedersen, Marianne G.; and Vaughan, Michael, to Maskinfabrikken Dan-Trim ApS. Solid fuel stoker. 4,593,629, Cl. 110-172.000.

Pedrazzi, Reinhard, to Sandoz Ltd. Azo compounds containing both sulfo groups and basic or cationic groups which compounds are in metal-free or 1:1 metal complex form. 4,594,410, Cl. 534-701.000.

Peetz, Wolfgang; Klaissle, Siegfried; Moser, Bernhard; and Muller, Norbert, to Hawera Probst GmbH & Co. Boring tool for producing undercuts in holes. 4,594,033, Cl. 408-156.000.

Pellegrini, Rinaldo: *See*—
Bellani, Piero; Clavenna, Gaetano; Sosio, Alberta; and Pellegrini, Rinaldo, 4,594,421, Cl. 546-121.000.

Pellerin Milnor Corporation: *See*—
Pellerin, Norvin L., 4,593,481, Cl. 34-133.000.

Pellerin, Norvin L., to Pellerin Milnor Corporation. Tumble dryer. 4,593,481, Cl. 34-133.000.

Pelster, Bernhard: *See*—
Dell, Hans-Dieter; Pelster, Bernhard; Kraus, Reinhold; and Schierstedt, Detlef, 4,594,357, Cl. 514-537.000.

Penco, Eugenio; and Salvetti, Gianemilio, to Enea-Comitato Nazionale per la Ricerca e lo Sviluppo dell'Energia Nucleare e dell'Energie Alternative; and Selenia - Industrie Elettroniche Associate S.p.A. Corona discharge preionized high pulse repetition frequency laser. 4,594,721, Cl. 372-88.000.

Penick, Joe E., to Mobil Oil Corporation. Method for the recovery of viscous oil utilizing mixtures of steam and oxygen. 4,593,759, Cl. 166-261.000.

Penner, David W.: *See*—
Thompson, Gregory J.; Lin, Kaung-Far; and Penner, David W., 4,594,322, Cl. 435-95.000.

Penny, Glenn S., to Halliburton Company. Compositions for increasing hydrocarbon production from subterranean formations. 4,594,200, Cl. 260-512.00R.

Pergola, Nicola F. Ski which may be disassembled or folded. 4,593,926, Cl. 280-603.000.

Perkin-Elmer Corporation, The: *See*—
McNally, Mark J., 4,594,002, Cl. 356-346.000.

Perrone, Agostino: *See*—
Cattaneo, Filippo; and Perrone, Agostino, 4,593,807, Cl. 198-457.000.

Perry, Thomas J.; and Khera, Muhammad I., to GTE Automatic Electric Inc. Remote data link transmit data formatter. 4,594,712, Cl. 371-49.000.

Perry, Thomas J.; and Khera, Muhammad I., to GTE Automatic Electric Inc. Remote data link receive data reformatter. 4,594,713, Cl. 371-49.000.

Peter, Wolfgang: *See*—
Hoft, Peter; Peter, Wolfgang; Hacke, Heinz; Luhr, Jurgen; Bergsteiner, Johann; Drobe, Wolfgang; Engelke, Fritz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,593,834, Cl. 220-273.000.

Petermann, Hans: *See*—
Haubner, Georg; Zobt, Hartmut; and Petermann, Hans, 4,594,572, Cl. 340-52.00F.

Peterson, Carl. Cutting torch guide. 4,593,887, Cl. 266-48.000.

Petry, Charles J.: *See*—
Hazelett, Robert W.; Petry, Charles J.; and Platek, Stanley W., 4,593,742, Cl. 164-415.000.

Pettersson, Rolf; and Tisell, Claes, to Affarsverket FFV. Propellant charge component for use with a projectile for muzzle-loaded weapons. 4,593,620, Cl. 102-372.000.

Petty, Walter L.: *See—*
Dong, Walter; and Petty, Walter L., 4,594,198, Cl. 558-351.000.

Pfandler, Martin: *See—*
Pfeiffer, Helmut; Dreyer, Volker; and Pfandler, Martin, 4,594,584, Cl. 340-620.000.

Pfarrwaller, Erwin, to Sulzer Brothers Limited. Guide for a weft-picking projectile in a weaving machine. 4,593,724, Cl. 139-188.00R.

Pfeifer, William, to Armstrong Store Fixture Corporation. Tag holder. 4,593,824, Cl. 211-57.100.

Pfeifer, Wolf D.: *See—*
Manner, Reinhard; Schaefer, Hans; Voigt, Carl; and Pfeifer, Wolf D., 4,594,234, Cl. 423-376.000.

Pfeiffer, Helmut; Dreyer, Volker; and Pfandler, Martin, to Endress u. Hauser GmbH u. Co. Device for determining and/or monitoring a predetermined filling level in a container. 4,594,584, Cl. 340-620.000.

Pfizer Hospital Products Group Inc.: *See—*
McKay, William F.; and Walker, Peter S., 4,593,685, Cl. 128-92.00E.

Pflaumer, Phillip F.: *See—*
Baker, Joseph S.; and Pflaumer, Phillip F., 4,594,259, Cl. 426-613.000.

Pharmacia AB: *See—*
Stalberg, Ralph I., 4,594,159, Cl. 210-198.200.

Phelps Dodge Corporation: *See—*
Satchell, Donald P., Jr.; and Gerlach, John N., 4,594,132, Cl. 204-105.00R.

Philip Morris Inc.: *See—*
Garthaffner, Martin T., 4,593,705, Cl. 131-84.400.

Phillips, Oliver V.; and Phillips, William R., to Phillips, Oliver V. Multi-fuel system for internal combustion engines. 4,594,201, Cl. 261-18.00B.

Phillips Petroleum Company: *See—*
McClintock, William A., 4,593,757, Cl. 165-162.000.

Phillips, William R.: *See—*
Phillips, Oliver V.; and Phillips, William R., 4,594,201, Cl. 261-18.00B.

Phillis, Gary L.: *See—*
Falk, Robert A.; and Phillis, Gary L., 4,594,000, Cl. 356-5.000.

Phipps, Peter B. P.: *See—*
Doss, Saad K.; and Phipps, Peter B. P., 4,594,273, Cl. 427-443.100.

Phy, William: *See—*
Harrah, Shane; and Phy, William, 4,594,493, Cl. 219-56.220.

Piatkowski, Adam: *See—*
Kepski, Roman; Walczak, Franciszek; Plucinski, Zbigniew; and Piatkowski, Adam, 4,593,702, Cl. 128-696.000.

Piccardi, Paolo: *See—*
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,352, Cl. 514-332.000.
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,451, Cl. 564-44.000.

Pierce, O. Leon, to Universal Data Systems. Synchronous receiver. 4,594,727, Cl. 375-83.000.

Pignal, Maurice; Tridon, Max; and Martin, Michel. Automatic machine with multiple stations for drying textile packages. 4,593,479, Cl. 34-58.000.

Pihl, Donald L.: *See—*
Wattles, Gurdon B.; and Pihl, Donald L., 4,593,631, Cl. 110-345.000.

Pina, Felice: *See—*
Galli, Graziano; and Pina, Felice, 4,594,277, Cl. 428-40.000.

Pioneer Electronic Corporation: *See—*
Sugibayashi, Kiyoshi; Oguchi, Tomihiro; and Takahori, Hiroyuki, 4,594,611, Cl. 358-191.100.
Takahashi, Hideyuki; Kenmotsu, Isami; Okajima, Takahiro; and Takahashi, Yoshio, 4,594,700, Cl. 369-39.000.

Piper, James R. Hot water supply system. 4,593,678, Cl. 126-427.000.

Pippinger, Horst: *See—*
Bruder, Gerhard; and Pippinger, Horst, 4,594,046, Cl. 414-332.000.

Pitney Bowes Inc.: *See—*
Hoffman, Wayne C., 4,594,042, Cl. 414-32.000.

Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with methylthioalkanoic acid esters. 4,594,254, Cl. 426-535.000.

Pitzenberger, Steven M.: *See—*
Bock, Mark G.; Evans, Ben E.; Freidinger, Roger M.; and Pitzenberger, Steven M., 4,594,191, Cl. 260-239.30P.

Planet Corporation: *See—*
Spiker, Michael G., 4,593,624, Cl. 104-172.00B.

Plassim Limited: *See—*
Raz, Dan, 4,593,857, Cl. 239-109.000.

Plasti-Line, Inc.: *See—*
Visocky, Joseph E.; and Ramsay, Charles F., 4,593,486, Cl. 40-490.000.

Platek, Stanley W.: *See—*
Hazelett, Robert W.; Petry, Charles J.; and Platek, Stanley W., 4,593,742, Cl. 164-415.000.

Plessey Overseas Limited: *See—*
Brettle, Jack; Lodge, Kevin J.; Loggie, Nicholas J.; Hughes, Simon M. P.; and Howell, William G., 4,594,472, Cl. 174-35.0GC.

Ploppa, Jurgen: *See—*
Mak, Gerd; and Ploppa, Jurgen, 4,594,585, Cl. 340-679.000.

Plucinski, Zbigniew: *See—*
Kepski, Roman; Walczak, Franciszek; Plucinski, Zbigniew; and Piatkowski, Adam, 4,593,702, Cl. 128-696.000.

Pluim, Arthur W., Jr. Method for neutralizing offensive chemicals. 4,594,239, Cl. 424-10.000.

Polak, Anthony J.; and Beuhler, Allyson J., to UOP Inc. Fuel cell using novel electrolyte membrane. 4,594,297, Cl. 429-13.000.

Polaroid Corporation: *See—*
Launie, Kenneth J.; and Whiteside, George D., 4,593,983, Cl. 354-217.000.

Poletti, Henri, to Regie Nationale des Usines Renault. Driving device of a rotating cylinder block of a pump or hydraulic motor. 4,593,604, Cl. 91-504.000.

Pollachek, Robert G., to RCA Corporation. Voltage level sensing circuit. 4,594,518, Cl. 307-350.000.

Pomares, Francis J. Paint applicator. 4,594,015, Cl. 401-266.000.

Poncy, Mark P.: *See—*
Poncy, Richard P.; and Poncy, Mark P., 4,593,699, Cl. 128-660.000.

Poncy, Richard P.; and Poncy, Mark P. Sterile cover for intraoperative ultrasonic diagnostic devices and method and kit for providing same. 4,593,699, Cl. 128-660.000.

Pont-A-Mousson S.A.: *See—*
Hauer, Jean-Claude; and Oger, Jacques, 4,594,026, Cl. 405-153.000.

Pool, Robert H.: *See—*
Breiholz, Arlen E.; Pool, Robert H.; and Sellers, Glenn W., 4,594,676, Cl. 364-565.000.

Poon, Stephen S. C.: *See—*
Sabongi, Gebran J.; Poon, Stephen S. C.; and Lea, Bernard A., 4,594,312, Cl. 430-339.000.

Popov, Nikola N.: *See—*
Natov, Miltcho A.; Vassileva, Stefanka V.; Kotchev, Hristo B.; Djagarov, Zvetan S.; and Popov, Nikola N., 4,594,372, Cl. 523-208.000.

Popp, Franz-Wolfgang; and Velten, Reinhold, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Container for storing radioactive materials. 4,594,214, Cl. 376-272.000.

Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., to GTE Laboratories Incorporated. Monolithic integrated circuit structure and method of fabrication. 4,593,459, Cl. 29-577.00C.

Porlier, Beth W.: *See—*
Roof, Glenn L.; Porlier, Beth W.; and Cravey, Wesley E., 4,594,147, Cl. 208-207.000.

Posluszny, Thomas: *See—*
Smith, Eugene; and Posluszny, Thomas, 4,594,549, Cl. 324-232.000.

Pousson, Michael W., Jr.: *See—*
Boulia, Dorothy I.; Pousson, Michael W., Jr.; Pring, Edward J.; and Stone, Nancy L., 4,594,674, Cl. 364-523.000.

Powel, Stephen S. Protective container for assembled printed circuit boards. 4,593,813, Cl. 206-328.000.

Poziomek, Edward J.: *See—*
Munavalli, Shekhar; and Poziomek, Edward J., 4,594,413, Cl. 544-180.000.

PPG Industries, Inc.: *See—*
Coleman, Charles R.; and Rukavina, Thomas G., 4,594,402, Cl. 528-49.000.
Gillery, F. Howard; and Criss, Russell C., 4,594,137, Cl. 204-192.0SP.
Kuhn, John J., 4,594,087, Cl. 65-1.000.

Presley-Nelson, Gary R.: *See—*
Guenthner, Russell W.; Shelly, William A.; Presley-Nelson, Gary R.; Marietta, Kala J.; and Wade, R. Morse, 4,594,659, Cl. 364-200.000.

Preston, Edward G.; and Stewart, David B., to Molins Limited. Producing filler material, particularly for cigarette filters. 4,593,706, Cl. 131-109.100.

Priam Corporation: *See—*
Viskochil, Stephen R.; and Simons, Brian H., 4,594,627, Cl. 360-105.000.

Price, Frank C.: *See—*
Clarkson, Andrew P.; Flanders, James R.; and Price, Frank C., 4,593,423, Cl. 12-145.000.

Price, Howard M.: *See—*
Bourland, Gordon, Jr.; and Price, Howard M., 4,594,120, Cl. 156-155.000.

Prime Computer, Inc.: *See—*
Hogan, Thomas C., 4,594,724, Cl. 375-7.000.

Pring, Edward J.: *See—*
Boulia, Dorothy I.; Pousson, Michael W., Jr.; Pring, Edward J.; and Stone, Nancy L., 4,594,674, Cl. 364-523.000.

Pritchett, Ervin G.; and Hoyt, John M., to National Distillers and Chemical Corporation. Halogenated ethylene/vinyl acetate/isobutylene terpolymers. 4,594,393, Cl. 525-330.300.

Procter & Gamble Company, The: *See—*
Baker, Joseph S.; and Pflaumer, Phillip F., 4,594,259, Cl. 426-613.000.
Cook, Thomas E.; Dyer, John C.; and Venegas, Manuel G., 4,594,184, Cl. 252-542.000.

Procter, Richard W.; and Anondson, Stanton L., to 21st Century Marketing, Inc. Method of altering intoxicating effects of alcohol. 4,594,249, Cl. 424-125.000.

Product Suppliers AG: *See—*
Aarts, Mathias L. C., 4,593,554, Cl. 73-49.300.

Proehl, Norman P. Method of dredging with a pivotally mounted cutter head. 4,593,484, Cl. 37-195.000.

Programmable Tracing Incorporated: *See—*
Cudnohufsky, Gerald G., 4,593,586, Cl. 82-14.00A.

Protocol Engineering Limited: *See—*
Rapsey, Colin; and Elworthy, John H., 4,594,499, Cl. 219-221.000.
Prototypes, Ltd.: *See—*
Dyson, James, 4,593,429, Cl. 15-353.000.
Prouvost S.A.: *See—*
Leclaire, Charly, 4,593,633, Cl. 112-121.110.
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., to Olin Corporation. Copper base alloy for forging from a semi-solid slurry condition. 4,594,117, Cl. 148-414.000.
Puck, Theodore T.: *See—*
Gusella, James F.; Housman, David; Keys, Cheryl; Varsanyi-Breiner, Aviva; Puck, Theodore T.; Jones, Carol; and Kao, Fa-Ten, 4,594,318, Cl. 435-6.000.
Pulman, David A.: *See—*
Elliott, Michael; Janes, Norman F.; Elliott, Richard L.; Khambay, Bhupinder P. S.; and Pulman, David A., 4,594,355, Cl. 514-521.000.
Purfurst, Ernest H., to Halliburton Company. Push-off pistons. 4,593,560, Cl. 73-155.000.
Puxkandl, Peter B.: *See—*
Schindl, Klaus P.; and Puxkandl, Peter B., 4,593,979, Cl. 350-514.000.
Quaker Oats Company, The: *See—*
Niemczyk, Michael J., 4,594,252, Cl. 426-307.000.
Quartana, Anthony J., III. Pilot control valve. 4,593,712, Cl. 137-106.000.
Quen, Stephen G.: *See—*
Chandra, Rangasami S.; Quen, Stephen G.; Eineichner, Donald E.; and Lastra, Jorge E., 4,594,665, Cl. 364-422.000.
Quinn, David G.: *See—*
Andersen, Erik; Edwards, Robert B., II; and Quinn, David G., 4,594,074, Cl. 604-270.000.
Rabinowitz, Mario; and Esselman, Walter H., to Electric Power Research Institute, Inc. Emission controlled current limiter for use in electric power transmission and distribution. 4,594,630, Cl. 361-13.000.
Radojewski, Hans: *See—*
Heidenreich, Klaus; Depcik, Hans-Werner; and Radojewski, Hans, 4,594,204, Cl. 264-25.000.
Rajaram, Babu: *See—*
Chandler, Gregg; and Rajaram, Babu, 4,594,587, Cl. 340-750.000.
Ramsay, Charles F.: *See—*
Visocky, Joseph E.; and Ramsay, Charles F., 4,593,486, Cl. 40-490.000.
Ramser, Robert A.: *See—*
Yu, Ho; Jacoby, John E.; and Ramser, Robert A., 4,593,745, Cl. 164-487.000.
Rand, David, Jr. Mechanical guitar chord maker. 4,593,595, Cl. 84-317.000.
Ranken, Paul F.; and McKinnie, Bonnie G., to Ethyl Corporation. Process for preparing (hydrocarbylthio)aromatic amines. 4,594,453, Cl. 564-440.000.
Rao, Leburu S., to Burroughs Wellcome Co. Anti-leishmanial pharmaceutical formulations. 4,594,241, Cl. 424-38.000.
Rapsey, Colin; and Elworthy, John H., to Protocol Engineering Limited. Apparatus for producing a line of separation in a plastic work surface. 4,594,499, Cl. 219-221.000.
Raychem Corporation: *See—*
Cook, John A.; Park, George B.; and McLoughlin, Robert H., 4,594,299, Cl. 429-129.000.
Raz, Dan, to Plassim Limited. Irrigation emitter unit. 4,593,857, Cl. 239-109.000.
RBS Pharma (Roger Bellon Schoum) S.p.A.: *See—*
Bellani, Piero; Clavenna, Gaetano; Sosio, Alberta; and Pellegrini, Rinaldo, 4,594,421, Cl. 546-121.000.
RCA Corporation: *See—*
Ackley, Donald E., 4,594,719, Cl. 372-50.000.
Clemente, Ralph, 4,593,737, Cl. 160-84.00R.
Cohen, William R.; and Gillberg, James E., 4,594,517, Cl. 307-296.00R.
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,594,560, Cl. 330-296.000.
Dischert, Robert A., 4,594,616, Cl. 360-36.100.
Earman, Allen M.; and Higashi, James Y., 4,594,701, Cl. 369-43.000.
Haferl, Peter E., 4,594,534, Cl. 315-408.000.
Hanak, Joseph J., 4,593,644, Cl. 118-719.000.
Henry, Dale V.; and Kaiser, Donald B., 4,594,494, Cl. 219-86.800.
Kramer, William M., 4,594,605, Cl. 357-31.000.
Krufka, Frank S., 4,594,684, Cl. 364-900.000.
Levine, Peter A., 4,594,612, Cl. 358-213.000.
Lewis, Henry G., Jr.; and Schiff, Leonard N., 4,594,607, Cl. 358-23.000.
Patel, Chandrakant B., 4,594,610, Cl. 358-144.000.
Pollachek, Robert G., 4,594,518, Cl. 307-350.000.
Willis, Donald H., 4,594,726, Cl. 375-26.000.
Årdal Og Sunndal Verk A.S.: *See—*
Stromme, Sigurd J., 4,593,864, Cl. 242-56.900.
Read, Randol R.; and Supernaw, John W., to Standard Oil Company. Seismic signal generator. 4,594,692, Cl. 367-13.000.
Reagents of University of Minnesota: *See—*
Vince, Robert, 4,594,350, Cl. 514-261.000.
Recastco Inc.: *See—*
Kelly, Edward; Bishop, Frederick T.; and Reilly, Donald J., 4,593,747, Cl. 164-496.000.
Reedy, Gerald T. Gas chromatography/matrix-isolation apparatus. 4,594,226, Cl. 422-89.000.
Rees Construction Services Limited: *See—*
Manlow, Terence V., 4,594,025, Cl. 405-147.000.
Reeves, Russell R., to Apace Research Limited. Recovery of alcohols. 4,594,466, Cl. 568-919.000.
Regen, Steven L., to Research Corporation. Thiol based lipids and membranes made therefrom. 4,594,193, Cl. 260-399.000.
Reggiori, Franca: *See—*
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,352, Cl. 514-332.000.
Massardo, Pietro; Bettarini, Franco; Giovarruscio, Gabriele; Piccardi, Paolo; Reggiori, Franca; Caprioli, Vincenzo; and Longoni, Angelo, 4,594,451, Cl. 564-44.000.
Regie Nationale des Usines Renault: *See—*
Lefevre, Remi; and Lagrue, Jean-Pierre, 4,593,666, Cl. 123-480.000.
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Reichel, Wolfgang: *See—*
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Reichman, Uri: *See—*
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Reid, Philip L. Motor rotating apparatus. 4,593,575, Cl. 74-421.00A.
Reifenhauser GmbH & Co. Maschinenfabrik: *See—*
Reifenhauser, Hans; Beisemann, Heinz; Reitemeyer, Paul; and Grabowski, Robert, 4,594,063, Cl. 425-141.000.
Reifenhauser, Hans; Beisemann, Heinz; Reitemeyer, Paul; and Grabowski, Robert, to Reifenhauser GmbH & Co. Maschinenfabrik. Extruder or calibrating die. 4,594,063, Cl. 425-141.000.
Reil, Wilhelm; and Deutschbein, Ulrich, to Tetra Pak Development. Liquid dispensing apparatus. 4,593,730, Cl. 141-258.000.
Reilly, Donald J.: *See—*
Kelly, Edward; Bishop, Frederick T.; and Reilly, Donald J., 4,593,747, Cl. 164-496.000.
Reimschuessel, Herbert K.; and Kocur, Michael A., to Allied Corporation. Process for the preparation of anhydrous N-(3-chloro-2-hydroxypropyl) trialkylammonium salts. 4,594,452, Cl. 564-292.000.
Reinbold, James F.: *See—*
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Reinecke, Paul S.: *See—*
Van Vonno, Nicolaas W.; Hull, Richard; and Reinecke, Paul S., 4,594,265, Cl. 427-53.100.
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Reitemeyer, Paul: *See—*
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Relyea, Keith E., to Minnesota Mining and Manufacturing Company. Printed, removable body tattoos on a translucent substrate. 4,594,276, Cl. 428-40.000.
Remenyi, Ferenc: *See—*
Gengenbach, Bruno; Meyer, Carl-Ludwig; Michal, Roland; and Remenyi, Ferenc, 4,594,489, Cl. 200-151.000.
Renard, Jean-Claude: *See—*
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Renard, Lucien P.: *See—*
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Renkes, Arthur H.: *See—*
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Renschler, Clifford L.: *See—*
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Renshaw, Alan: *See—*
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Nauman, E. Bruce, 4,594,371, Cl. 523-340.000.
Republic Welding Company: *See—*
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Research Corporation: *See—*
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Resnick, Paul R.: *See—*
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Revankar, Ganapathi R.: *See—*
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Reyes, Pedro: *See—*
Vaqueiro, M. Cristina; and Reyes, Pedro, 4,594,260, Cl. 426-622.000.
RG Dynamics, Inc.: *See—*
Grodinsky, Robert M.; and Cornwell, David G., 4,594,561, Cl. 330-297.000.
Rhoads, Paul M.; and Renkes, Arthur H., to NCR Corporation. Bootstrap drive for a two-transistor forward converter. 4,594,649, Cl. 363-56.000.
Rhodes, Geoffrey M., to Conax Buffalo Corporation. Fiber optic feedthrough module, and method of making same. 4,593,970, Cl. 350-96.200.

Rhodes, Joseph C., Jr.: *See*—
Moore, Victor S.; Veneski, Gerard A.; Parker, Tony E.; Rhodes, Joseph C., Jr.; Kraft, Wayne R.; and Stahl, William L., Jr., 4,594,661, Cl. 364-200.000.
Rhodes, Keith H.: *See*—
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Rhone-Poulenc Sante: *See*—
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Rhone:Pulenc, Inc.: *See*—
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Ribaud, Patricia: *See*—
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Rich, John W. Door bracket for use in vehicle bodywork. 4,593,946, Cl. 292-288.000.
Richard Wolf GmbH: *See*—
Heckele, Helmut, 4,593,682, Cl. 128-6.000.
Richards, Joseph C.: *See*—
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Ricoh Company, Ltd.: *See*—
Akiyama, Hideaki; Iguchi, Susumu; and Horigome, Hirofumi, 4,593,988, Cl. 354-409.000.
Arora, Sanjiv, 4,594,600, Cl. 346-160.000.
Tomita, Satoru, 4,594,599, Cl. 346-160.000.
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Rideout, James M.: *See*—
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Rieger, Herbert. Upright red wine fermentation tank. 4,593,612, Cl. 99-277.200.
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Rieter Machine Works Limited: *See*—
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Riggarna Sundman, Larsson & Josefsson AB: *See*—
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Risser, Dale M.: *See*—
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Rivas, Andrew; Rivas, Robert; Pace, James; and Cavanaugh, Timothy. Quoit throwing game. 4,593,912, Cl. 273-339.000.
Rivas, Robert: *See*—
Rivas, Andrew; Rivas, Robert; Pace, James; and Cavanaugh, Timothy, 4,593,912, Cl. 273-339.000.
Rivier, Jean E. F.: *See*—
Vale, Wylie W., Jr.; and Rivier, Jean E. F., 4,594,329, Cl. 514-12.000.
Roarty, John C., to Exxon Research & Engineering Co. Reforming process for enhanced benzene yield. 4,594,145, Cl. 208-79.000.
Robb, John D.: *See*—
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Robert Bosch GmbH: *See*—
Bonitz, Jorg; Entemann, Robert; Miller, Bernhard; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, 4,593,553, Cl. 73-35.000.
Haubner, Georg; Zobt, Hartmut; and Petermann, Hans, 4,594,572, Cl. 340-52.00F.
Knorreck, Peter; and Kramer, Manfred, 4,593,962, Cl. 339-94.00M.
Leiber, Heinz, 4,593,955, Cl. 303-106.000.
Roberts, Royce G. Apparatus for cleaning large pipe threads. 4,593,451, Cl. 29-560.000.
Roberts, Thomas G.: *See*—
Greene, Hugh W.; Holder, James D.; and Roberts, Thomas G., 4,594,546, Cl. 324-122.000.
Robertson, Frank C.: *See*—
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Robeson, Lloyd M.: *See*—
Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., 4,594,404, Cl. 528-174.000.
Robins, Roland K.; and Srivastava, Prem C., to Brigham Young University. 2-β-D-ribofuranosylselenazole-4-carboxamide compounds and methods for their production. 4,594,414, Cl. 536-18.700.
Robins, Roland K.; and Revankar, Ganapathi R. Azole dinucleotide compositions and methods of use. 4,594,415, Cl. 536-27.000.
Robins, Roland K.; and Srivastava, Prem C., to Brigham Young University. 2-β-D-ribofuranosylselenazole-4-carboxamide compounds and methods for their production. 4,594,416, Cl. 536-121.000.
Robotic Vision Systems, Inc.: *See*—
DiMatteo, Paul; Ross, Joseph; and Schmidt, Richard, 4,594,001, Cl. 356-376.000.
Rockwell International Corporation: *See*—
Breiholz, Arlen E.; Pool, Robert H.; and Sellers, Glenn W., 4,594,676, Cl. 364-565.000.
Cheung, Derek T., 4,593,456, Cl. 29-573.000.
Tam, Matthias L.; and Custode, Frank Z., 4,593,453, Cl. 29-571.000.
Rogers Corporation: *See*—
Hernandez, Jorge M., 4,594,641, Cl. 361-306.000.
Rogers, Elmer H., Jr., to Aluminum Company of America. Heat exchanger. 4,593,755, Cl. 165-145.000.
Rohde, Siegfried: *See*—
Bonitz, Jorg; Entemann, Robert; Miller, Bernhard; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, 4,593,553, Cl. 73-35.000.
Rohm GmbH Chemische Fabrik: *See*—
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Rohm, Gunter H. Face drive for lathe. 4,593,588, Cl. 82-40.00R.
Rohm and Haas: *See*—
Chong, Berni P.; and Isacoff, Eric G., 4,594,158, Cl. 210-193.000.
Rohm and Haas Company: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,594,100, Cl. 71-124.000.
Blankenship, Robert M.; and Kowalski, Alexander, 4,594,363, Cl. 521-64.000.
Patterson, Dennis R., 4,594,133, Cl. 204-158.100.
Rolls Royce Limited: *See*—
Ellis, Victor E. H., 4,593,566, Cl. 73-660.000.
Romao, Nuno; and Mudrinic, Ivica, to Viewstar Inc. Scrambling system for television video signal. 4,594,609, Cl. 358-119.000.
Romer, Michael: *See*—
Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidensschink, Rudolf; and Romer, Michael, 4,594,465, Cl. 568-642.000.
Roof, Glenn L.; Porlier, Beth W.; and Cravey, Wesley E., to Nalco Chemical Company. Choline as a fuel sweetener and sulfur antagonist. 4,594,147, Cl. 208-207.000.
Rosemount Inc.: *See*—
Coursolle, Thomas P.; and Murphy, Patrick J., 4,594,504, Cl. 250-227.000.
Rosen, Terry K. Apparatus and method for enhancing the perceived sound image of a sound signal by source localization. 4,594,730, Cl. 381-27.000.
Rosl, Wolfgang, to International Standard Electric Corporation. Impulse generator. 4,594,483, Cl. 200-6.00B.
Ross, Joseph: *See*—
DiMatteo, Paul; Ross, Joseph; and Schmidt, Richard, 4,594,001, Cl. 356-376.000.
Rosset, Ivo, to I.C.C. -Integrated Camera Complements s.r.l. Device for taking panoramic photographs with ordinary cameras. 4,593,982, Cl. 354-99.000.
Rossi, Albert: *See*—
Achia, Biddanda U.; DeKraker, Abraham R.; and Rossi, Albert, 4,594,142, Cl. 208-33.000.
Rossi, Francis: *See*—
Meyers, Richard F.; Rossi, Francis; and Strahle, Werner, 4,594,690, Cl. 365-230.000.
Rossner, Heinrich-Otto: *See*—
Bebber, Hans J.; Rossner, Heinrich-Otto; and Tomalla, Gebhard, 4,594,496, Cl. 219-121.0PP.
Roth, Martin: *See*—
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,594,400, Cl. 526-256.000.
Roth, Siegfried: *See*—
Kilger, Fridbert; Roth, Siegfried; Breithaupt, Rupert; Menke, Jupp; and Zeifang, Gunter, 4,594,503, Cl. 250-203.00R.
Rotondi, Anthony J.; Mullich, Richard O.; and Carabet, George F., to TRE Corporation. Deadbolt assembly having selectable backset distance. 4,593,542, Cl. 70-134.000.
Roussel-Uclaf: *See*—
Bianchi, Mario; and Barzaghi, Fernando, 4,594,443, Cl. 560-053.000.
Rouxel, Jean: *See*—
Niquel, Maurice; Gourdon, Claude; and Rouxel, Jean, 4,594,728, Cl. 375-116.000.
Rowe, Richard A.: *See*—
Wilham, Donald W.; and Rowe, Richard A., 4,594,481, Cl. 200-5.00A.
Rubery Owen-Rockwell Limited: *See*—
Davis, Robert C. B., 4,593,930, Cl. 280-690.000.
Rudert, Wolfgang: *See*—
Baring, Rolf; Rudert, Wolfgang; and Wolters, Gerd-Michael, 4,593,662, Cl. 123-198.00F.
Ruger, William B.; and Melcher, Roy L., to Sturm, Ruger & Company, Inc. Latch arrangement for pistol spring strut. 4,593,487, Cl. 42-7.000.
Ruger, William B., to Sturm, Ruger & Company, Inc. Receiver for bolt action firearm and method of manufacture. 4,593,488, Cl. 42-75.00C.
Ruhland, Michael: *See*—
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,594,436, Cl. 549-359.000.
Ruhnau, Gerhard: *See*—
Neuhaus, Detlev; Hesse, Karl-Heinz; Ruhnau, Gerhard; and Liermann, Peter, 4,594,571, Cl. 340-52.00F.
Ruksvina, Thomas G.: *See*—
Coleman, Charles R.; and Rukavina, Thomas G., 4,594,402, Cl. 528-49.000.
Runciman, Herbert M., to Barr & Stroud Limited. Radiation scanning systems. 4,594,508, Cl. 250-334.000.
Rupp, Gunter: *See*—
Heitmann, Hans-Gunter; and Rupp, Gunter, 4,594,160, Cl. 210-222.000.
Russeau, Raymond J., to Schindler Haughton Elevator Corporation. Apparatus and method for installing elevator rails. 4,593,794, Cl. 187-95.000.
Russell, David B.; Gitlitz, Melvin H.; Leiner, Howard H.; Khuddus, Mo A.; and Berger, Abe, to M&T Chemicals Inc. Erodible ship-bottom paints for control of marine fouling. 4,594,365, Cl. 523-122.000.

Russell, Robert L., to Westinghouse Electric Corp. Panel base electrical raceway. 4,593,505, Cl. 52-221.000.

Ryan, Thomas G.: *See—*
Hartman, Thomas W.; and Ryan, Thomas G., 4,593,506, Cl. 52-221.000.

Ryobi Ltd.: *See—*
Ishii, Koji; and Maehara, Kenso, 4,593,619, Cl. 101-409.000.

Rys-Sikora, John: *See—*
Geissel Francis A.; Alexander, William W.; and Rys-Sikora, John, 4,594,367, Cl. 523-167.000.

S. B. Green Partnership: *See—*
Bodine, Paul D., 4,593,490, Cl. 47-79.000.

S. K. Wellman Company, The: *See—*
Danko, Donald M., Jr., 4,593,802, Cl. 192-107.00M.

S O Eriksson Maskin AB: *See—*
Ericsson, Sven O., 4,593,732, Cl. 144-2.00Z.

Sabelus, Gunther: *See—*
Kempter, Fritz E.; Sabelus, Gunther; Schupp, Eberhard; and Weiss, Wolfram, 4,594,403, Cl. 528-113.000.

Sabia, Raffaele A.: *See—*
Chapin, John T.; and Sabia, Raffaele A., 4,594,380, Cl. 524-144.000.

Sabongi, Gebran J.; Poon, Stephen S. C.; and Lea, Bernard A., to Minnesota Mining and Manufacturing Company. Heat bleachable dye systems. 4,594,312, Cl. 430-339.000.

Sace S.p.A. Costruzioni Elettromeccaniche: *See—*
Talpo, Gianpietro, 4,594,488, Cl. 200-148.00R.

Sachar, Howard E.: *See—*
Hao, Hsieh T.; Ling, Huei; Sachar, Howard E.; Weiss, Jeffrey; and Yamour, Yannis J., 4,594,655, Cl. 364-200.000.

Sachs, Emanuel M.: *See—*
Ciszek, Theodore F.; and Hurd, Jeffery L., 4,594,229, Cl. 422-246.000.

Safar, Tibor. Circular cutter. 4,593,467, Cl. 30-300.000.

Safety Railway Service Corporation: *See—*
Wattles, Gurdon B.; and Pihl, Donald L., 4,593,631, Cl. 110-345.000.

St. Florian Company: *See—*
Klievoneit, Harold R.; and Esposito, Augustine G., 4,593,496, Cl. 51-118.000.

St. Louis, Robert M., to Camco Inc. Retainer clip. 4,593,441, Cl. 24-297.000.

Saito, Fuminari: *See—*
Kanchiku, Hiroshi; Kajino, Jiro; and Saito, Fuminari, 4,594,624, Cl. 360-90.000.

Saito, Naoki, to Nippon Seiko Kabushiki Kaisha. Power assist steering gear assembly. 4,593,780, Cl. 180-79.100.

Saito, Shiuji: *See—*
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; Nakashima, Yoshimoto; and Sota, Kaoru, 4,594,197, Cl. 558-255.000.

Saito, Tetsuro; and Komura, Akihiko, to Canon Kabushiki Kaisha. Input element with improved appearance and reliability. 4,594,482, Cl. 200-5.00A.

Saito, Yoshizi; Nakamura, Masaru; Iida, Toyoshi; and Honda, Tsugunori, to Japan Metals and Chemicals Co., Ltd. Drilling fluid additives. 4,594,169, Cl. 252-8.50C.

Sakai, Yoshiaki: *See—*
Shoji, Makoto; and Sakai, Yoshiaki, 4,594,620, Cl. 360-75.000.

Sakakibara, Shuzi: *See—*
Omori, Toshihiko; Sakakibara, Shuzi; Kato, Masaaki; and Masuda, Akira, 4,593,664, Cl. 123-446.000.

Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, to Nippon Piston Ring Co., Ltd. Vane type rotary compressor with rotary sleeve. 4,594,062, Cl. 418-173.000.

Sakamoto, Osamu; Tsuruta, Yasuhiko; Sasaki, Haruo; Tsukamoto, Yasuo; and Kudo, Kiyoshi, to Taisei Corporation. Fluid mixing method and apparatus. 4,594,005, Cl. 366-177.000.

Sakata, Jiro: *See—*
Yamamoto, Minoru; and Sakata, Jiro, 4,594,079, Cl. 55-158.000.

Sakata, Shinji: *See—*
Fujishima, Tetsuro; and Sakata, Shinji, 4,594,321, Cl. 435-89.000.

Sakata, Tadakazu: *See—*
Iwata, Fumio; Nakamura, Takato; and Sakata, Tadakazu, 4,594,424, Cl. 548-127.000.

Sakiyama, Kazuo: *See—*
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,594,379, Cl. 524-114.000.

Salesky, William J.; Ecer, Gunes M.; and Kuhn, Karl O., to Smith International, Inc. Rock bits having metallurgically bonded cutter inserts. 4,593,776, Cl. 175-375.000.

Salk Institute for Biological Studies, The: *See—*
Vale, Wylie W., Jr.; and Rivier, Jean E. F., 4,594,329, Cl. 514-12.000.

Salmon, John K., to Otis Elevator Company. Elevator door configuration. 4,593,793, Cl. 187-56.000.

Salomon, George P. J.; and Hue, Jean, to Salomon S.A. Pivotable cross-country ski binding. 4,593,927, Cl. 280-615.000.

Salomon S.A.: *See—*
Paris, Jean, 4,593,483, Cl. 36-119.000.
Salomon, George P. J.; and Hue, Jean, 4,593,927, Cl. 280-615.000.

Salort, Guy J. External appliance for the trunk of the body. 4,593,697, Cl. 128-538.000.

Salvetti, Gianemilio: *See—*
Penco, Eugenio; and Salvetti, Gianemilio, 4,594,721, Cl. 372-88.000.

Salyer, Ival O.; and Fox, Bernard L., to University of Dayton. Phenol-formaldehyde intumescent coating composition and coating prepared therefrom. 4,594,368, Cl. 523-179.000.

Salz, Jack: *See—*
Farrow, Cecil W.; and Salz, Jack, 4,594,479, Cl. 179-170.200.

Samal, Prasanna K., to SCM Corporation. Direct powder rolling of dispersion strengthened metals or metal alloys. 4,594,217, Cl. 419-3.000.

Samelson, Charles F.: *See—*
Lloyd, Stephen R.; and Samelson, Charles F., 4,593,686, Cl. 128-136.000.

Sampathkumar, to UC Unitas Corporation. Process for recovering tocopherols from deodorizer sludge. 4,594,437, Cl. 549-413.000.

Sandberg, Christopher T.; and Paulson, Gary F., to Truth Incorporated. Snap stud. 4,593,431, Cl. 16-381.000.

Sanden Corporation: *See—*
Hatakeyama, Hideharu; and Takahashi, Hidenao, 4,594,055, Cl. 417-269.000.
Kiyoshi, Terauchi, 4,594,061, Cl. 418-55.000.

Sanders Associates, Inc.: *See—*
Brewer, Howard E.; and Lyons, A. William, II, 4,594,672, Cl. 364-520.000.
Liu, Dean-Yuan; Guy, Jon S.; Siu, Howard W. H.; and Shaver, Michael A., 4,594,597, Cl. 346-76.0PH.
Struckman, Keith A., 4,594,595, Cl. 343-770.000.

Sandoz Ltd.: *See—*
Pedrazzi, Reinhard, 4,594,410, Cl. 534-701.000.

Sandstrom, Paul H.: *See—*
Lal, Joginder; and Sandstrom, Paul H., 4,594,389, Cl. 525-187.000.

Sangamo Weston Limited: *See—*
Simms, David W., 4,593,959, Cl. 339-17.00C.

Sant'Andrea Novara Officine Meccaniche e Fonderie S.p.A.: *See—*
Saviolo, Giuseppe, 4,593,643, Cl. 118-72.000.

Sanyo Electric Co., Ltd.: *See—*
Morioka, Yuji; Yamasita, Sigeru; and Yano, Yoshiaki, 4,594,300, Cl. 429-225.000.

Saravis, Lawrence M. Surgical stapler for implanting sutures. 4,593,843, Cl. 227-19.000.

Sargunam, Issac P., to Magic Chef. Range grate and retaining clip assembly. 4,593,677, Cl. 126-214.00C.

Sari, Hikmet: *See—*
Desperben, Lydie; Sari, Hikmet; Moridi, Said; and Bonnerot, Georges, 4,594,725, Cl. 375-15.000.

Sasage, Yoshihiro: *See—*
Natsume, Kazuyuki; Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, 4,593,920, Cl. 280-6.00R.

Sasaki, Haruo: *See—*
Sakamoto, Osamu; Tsuruta, Yasuhiko; Sasaki, Haruo; Tsukamoto, Yasuo; and Kudo, Kiyoshi, 4,594,005, Cl. 366-177.000.

Sasaki, Noboru; Aida, Shunichi; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,594,317, Cl. 430-574.000.

Sasaki, Shoji; Mori, Yasunori; and Sugiura, Noboru. Engine control device. 4,593,667, Cl. 123-488.000.

Sasaki, Takashi: *See—*
Kimura, Toshihiko; Sasaki, Takashi; and Kaneko, Yutaka, 4,594,314, Cl. 430-506.000.

Sasaki, Toru, to Nohmi Bosai Kogyo Co. Ltd. Ionization type smoke detector. 4,594,512, Cl. 250-384.000.

Sasamori, Takehusa: *See—*
Haga, Katutoshi; Sasamori, Takehusa; Kurita, Teizi; and Katumata, Noriaki, 4,594,037, Cl. 409-144.000.

Sasib S.p.A.: *See—*
Gherardi, Gianluigi, 4,593,589, Cl. 83-168.000.

Satchell, Donald P., Jr.; and Gerlach, John N., to Phelps Dodge Corporation. Chloride hydrometallurgical process for production of copper. 4,594,132, Cl. 204-105.00R.

Sato, Hideo: *See—*
Horie, Seiji; Nagata, Masayoshi; Nakano, Junji; and Sato, Hideo, 4,594,303, Cl. 430-59.000.

Sato, Hiroshi: *See—*
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,594,101, Cl. 75-0.50C.

Sato, Kiyosumi: *See—*
Matsunoshita, Fumirou; and Sato, Kiyosumi, 4,594,710, Cl. 371-16.000.

Sato, Koji: *See—*
Kawano, Hikaru; Sato, Koji; and Nogi, Hiroyoshi, 4,594,043, Cl. 414-43.000.

Sato, Kunio: *See—*
Kanzaki, Minoru; Komiya, Kazumi; Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, 4,594,733, Cl. 382-50.000.

Sato, Shigeaki: *See—*
Tachida, Hiroki; Sato, Takane; and Sato, Shigeaki, 4,593,594, Cl. 84-185.000.

Sato, Takane: *See—*
Tachida, Hiroki; Sato, Takane; and Sato, Shigeaki, 4,593,594, Cl. 84-185.000.

Sato, Takateru; and Shiba, Haruo, to TDK Electronics Company, Ltd. Reel spring of magnetic tape cassette. 4,593,868, Cl. 242-199.000.

Satoh, Susumu; Kobayashi, Ichiro; Takakura, Yumiko; and Tamada, Mitsuru, to Nitto Electric Industrial Co., Ltd. Base composition for medicament and pharmaceutical composition for external medication. 4,594,243, Cl. 424-78.000.

Saviolo, Giuseppe, to Sant'Andrea Novara Officine Meccaniche e Fonderie S.p.A. Device for the application of identification marks to tubes for the winding of textiles. 4,593,643, Cl. 118-72.000.

Sawada, Daisaku; Shigematu, Takashi; and Tokoro, Setsuo, to Toyota Jidosha Kabushiki Kaisha. Continuously variable transmission means for use in vehicles. 4,593,582, Cl. 74-866.000.

Schack, Carl J.; and Christe, Karl O., to United States of America, Air Force. Process for preparing pentafluorotellurium hypofluorite. 4,594,232, Cl. 423-293.000.

Schad, Alfred; and Heyse, Klaus, to Hoechst Aktiengesellschaft. Plastic pipe having an oxygen-impermeable casing. 4,593,853, Cl. 237-56.000.

Schaefer, Hans: *See—*
Manner, Reinhard; Schaefer, Hans; Voigt, Carl; and Pfeifer, Wolf D., 4,594,234, Cl. 423-376.000.

Schaefer, Karl; Frank-Fahle, Gottfried; and Gasenzer, Norbert, to Inter-Wood Maschinen GmbH & Co. Method for the manufacture of chips from mineral, vegetable or embrittled materials and apparatus for carrying out the method. 4,593,862, Cl. 241-88.000.

Schaefer-Luederssen, Ulrich; Jaedicke, Hagen; Paust, Joachim; and Eggersdorfer, Manfred, to BASF Aktiengesellschaft. Racemic and optically active 3-hydroxy-alpha-cyclocitral, its acetals and optically active 3-oxo-alpha-cyclocitral acetals, and their preparation. 4,594,456, Cl. 568-447.000.

Schafer, David E.: *See—*
Sikorski, James A.; and Schafer, David E., 4,594,093, Cl. 71-87.000.

Schafer, Hartmut; and Linder, Franz. Marker block for divisions on trafficways in form of an oblong beam-like body and having reflective means. 4,594,021, Cl. 404-14.000.

Schafer, Ralf: *See—*
Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., 4,594,531, Cl. 315-307.000.

Schatz, Oskar. Process for increasing the heat flow density of heat exchangers working with at least one high-velocity gaseous medium, and a heat exchanger apparatus for undertaking the process. 4,593,749, Cl. 165-1.000.

Schawann, Jean C.; Caumont, Jean P.; and Falcimaigne, Jean, to Societe Nationale Elf Aquitaine. Device for connecting and disconnecting a tubular pipe movable inside a fixed tubular pipe. 4,593,937, Cl. 285-18.000.

Scheck, Georg; and Bogner, Martin, to Geze GmbH. Safety toe unit for a ski binding. 4,593,928, Cl. 280-625.000.

Scheel, Russell H.: *See—*
Gutekunst, Stanley K.; Scheel, Russell H.; and Ziegenfus, Barry L., 4,593,623, Cl. 104-166.000.

Scheithauer, Eric A.; and Jaycox, Donald F., to Northern Telecom Limited. Overload protector for communication systems. 4,594,635, Cl. 361-119.000.

Scheithauer, Richard A.; Miller, Michael J.; and Vanderpool, Clarence D., to GTE Products Corporation. Recovery of cobalt. 4,594,230, Cl. 423-140.000.

Schenck, Robert R. Methods and apparatus for anastomosing living vessels. 4,593,693, Cl. 128-334.00R.

Schenkenberger, Ernst, to Ciba-Geigy Corporation. Process for spray-drying readily water-soluble dyes and fluorescent brighteners. 4,594,075, Cl. 8-499.000.

Schenkman, Roger B. Can stacker. 4,593,818, Cl. 206-503.000.

Schering Aktiengesellschaft: *See—*
Skotsch, Carlo; Baumert, Dietrich; and Krahmer, Hansjorg, 4,594,095, Cl. 71-92.000.

Schick, Jerome D., to International Business Machines Corporation. Programmed control of electron beam power. 4,594,554, Cl. 328-268.000.

Schierstedt, Detlef: *See—*
Dell, Hans-Dieter; Pelster, Bernhard; Kraus, Reinhold; and Schierstedt, Detlef, 4,594,357, Cl. 514-537.000.

Schiff, Leonard N.: *See—*
Lewis, Henry G., Jr.; and Schiff, Leonard N., 4,594,607, Cl. 358-23.000.

Schindel, Arnold, to Singer Company, The. Micro stepping drive. 4,593,576, Cl. 74-424.80B.

Schindl, Klaus P.; and Puxkandl, Peter B., to C. Reichert Optische Werke AG. Tilting microscope binocular body. 4,593,979, Cl. 350-514.000.

Schindler Haughton Elevator Corporation: *See—*
Russeau, Raymond J., 4,593,794, Cl. 187-95.000.

Schips, Helmut. Sewing machine with apparatus for sewing a curved seam. 4,593,636, Cl. 112-308.000.

Schlicher, Rex L. Repeatable explosive-driven pulse generator system and method. 4,594,521, Cl. 310-15.000.

Schlumberger Technology Corporation: *See—*
Devaney, Anthony J., 4,594,662, Cl. 364-400.000.
Grimaldi, Pierre; and Trouiller, Jean C., 4,594,552, Cl. 324-375.000.
Kimball, Christopher V.; and Marzetta, Thomas L., 4,594,691, Cl. 367-32.000.

Schlussas-Abele, Heiderose, legal representative: *See—*
Koppe, Herbert; Abele, Wolfgang, deceased; Esser, Franz; Gaida, Wolfram; and Hoefke, Wolfgang, 4,594,344, Cl. 514-222.000.

Schmadel, Donald C.: *See—*
Goodman, Jack E.; and Schmadel, Donald C., 4,593,969, Cl. 350-96.190.

Schmalbach-Lubeca AG: *See—*
Hoft, Peter; Peter, Wolfgang; Hacke, Heinz; Luhr, Jurgen; Bergsteiner, Johann; Drobe, Wolfgang; Engelke, Fritz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,593,834, Cl. 220-273.000.

Schmidt, Richard: *See—*
DiMatteo, Paul; Ross, Joseph; and Schmidt, Richard, 4,594,001, Cl. 356-376.000.

Schminke, Wolfram, to BBC Brown, Boveri & Company, Ltd. High-voltage direct-current supply with over-current protection. 4,594,634, Cl. 361-93.000.

Schmitt, Eugene W., to Sloan Valve Company. Compression type railroad brake slack adjuster. 4,593,797, Cl. 188-196.00D.

Schmitt, Walter, to Dr. Johannes Heidenhain GmbH. Monitoring circuit for positioning device. 4,594,538, Cl. 318-565.000.

Schmitt, Walter; and Ritz, Franz, to Dr. Johannes Heidenhain GmbH. Apparatus for digitally subdividing analog periodic signals. 4,594,579, Cl. 340-347.0SY.

Schnabel, Rolf; and Weitz, Hans-Martin, to BASF Aktiengesellschaft. Preparation of butane-1,4-diol. 4,594,462, Cl. 568-864.000.

Schneider, Egon; and Kohler, Wolfgang, to Kraftwerk Union Aktiengesellschaft. Distributor for two-phase mixtures, especially water-steam mixtures in forced-circulation boilers. 4,593,653, Cl. 122-365.000.

Scholten, Pieter C.; Snyder, Fred W.; and Sorkin, Howard, to U.S. Philips Co.poration; and North American Philips Corporation. Process for coating inorganic particles with condensating polymers. 4,594,271, Cl. 427-221.000.

Schomburg, John R.; and Bushard, Louis B., to Sperry Corporation. Apparatus for performing quadratic convergence division in a large data processing system. 4,594,680, Cl. 364-765.000.

Schott, Heinrich, to Siemens Aktiengesellschaft. Switching regulator using dual slope sawtooth generator. 4,594,541, Cl. 323-288.000.

Schroeder, Charles M.: *See—*
Paek, Un-Chul; and Schroeder, Charles M., 4,594,088, Cl. 65-3.400.

Schroer, Walter: *See—*
Thoma, Wilhelm; Noll, Klaus; Nachtkamp, Klaus; Pedain, Josef; and Schroer, Walter, 4,594,385, Cl. 524-839.000.

Schulze, Bernd-Guido, to Volkswagenwerk Aktiengesellschaft. Device for shifting without clutch and without synchronizing elements in a multiple gear ratio transmission of a vehicle. 4,593,580, Cl. 74-858.000.

Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, to BASF Aktiengesellschaft. Cathodic electrocoating binders. 4,594,136, Cl. 204-181.700.

Schupp, Eberhard: *See—*
Kempter, Fritz E.; Sabelus, Gunther; Schupp, Eberhard; and Weiss, Wolfram, 4,594,403, Cl. 528-113.000.

Schurter, Rolf; Fory, Werner; and Meyer, Willy, to Ciba-Geigy Corporation. N-phenylsulfonyl-N'-triazinylureas. 4,594,097, Cl. 71-93.000.

Schwab, Walter. Rotary pump for blood and other sensitive liquids. 4,594,060, Cl. 418-54.000.

Schwartz, Abraham, to Magnetic Activated Particle Sorting, Inc. Microscope assembly for magnetic specimens. 4,593,980, Cl. 350-529.000.

Schwarz, John F. Linear actuator. 4,593,571, Cl. 74-89.200.

Schwindt, Jurgen: *See—*
Stahl, Hans-Georg; Schwindt, Jurgen; and Nachtkamp, Klaus, 4,594,374, Cl. 523-501.000.

Scifres, Donald R.; Streifer, William; and Burnham, Robert D., to Xerox Corporation. Combination index/gain guided semiconductor lasers. 4,594,718, Cl. 372-45.000.

Scilipoti, Joseph F., to Master Contact Lens Labs Inc. Bifocal contact lens. 4,593,981, Cl. 351-161.000.

SCM Corporation: *See—*
Samal, Prasanna K., 4,594,217, Cl. 419-3.000.

Scott, Malcolm K., to McNeilab, Inc. Furan or thiophene derivatives of iminomethyl piperidines and use to inhibit gastric secretion. 4,594,351, Cl. 514-320.000.

Scranton, Robert A.: *See—*
Caruso, Mark B.; and Scranton, Robert A., 4,593,956, Cl. 384-1.000.

Sebest, Albert E.: *See—*
Wolpert, George H., Jr.; and Sebest, Albert E., 4,593,422, Cl. 5-503.000.

Seely, James R.; and Ursprung, Cecil E., to Marketing Displays, Inc. Compact sign stand. 4,593,879, Cl. 248-624.000.

Seger, Harold C.; and Cowan, Norman M., to Grove Valve and Regulator Co. Orifice plate seal ring. 4,593,915, Cl. 277-12.000.

Seidel, Henning; Wildenau, Wolfgang; and Mantke, Joachim, to H.F. & Ph.F. Reemtsma GmbH & Co. Variably ventilated filter cigarette. 4,593,707, Cl. 131-336.000.

Seikosha Co., Ltd.: *See—*
Hayashi, Mikio, 4,594,011, Cl. 400-200.000.

Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, to Nissan Motor Company, Limited. Method and system for detection of driver drowsiness by an abrupt steering change following no steering movement. 4,594,583, Cl. 340-576.000.

Selenia - Industrie Elettroniche Associate S.p.A.: *See—*
Penco, Eugenio; and Salvetti, Gianemilio, 4,594,721, Cl. 372-88.000.

Sellers, Glenn W.: *See—*
Breiholz, Arlen E.; Pool, Robert H.; and Sellers, Glenn W., 4,594,676, Cl. 364-565.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei, 4,594,471, Cl. 136-249.000.

Servel, Michel; and Thomas, Alain. Synchronization for a digital train intended for a correct framing of received information. 4,594,708, Cl. 370-94.000.

Seybold, Rolf: *See—*
Evertz, Egon; and Seybold, Rolf, 4,593,846, Cl. 227-130.000.

Shanklin, James R., Jr.; and Wilkinson, James M., II. 1-[(aminoalkyl and aminoalkylamino)carbonyl and thiocarbonyl]-α,α-diarylpyrrolidine, piperidine and homopiperidineacetamides and acetonitriles. 4,594,343, Cl. 514-212.000.
Sharma, Devendra N. Surface game projectile manipulating device. 4,593,906, Cl. 273-129.00R.
Sharma, Rameshwar K., to University of Tennessee Research Corp., The. Protein kinase enzyme AUT-PK 500 and a radioimmunoassay for detection of neoplasia. 4,594,319, Cl. 435-7.000.
Sharp Kabushiki Kaisha: *See*—
Fujiwara, Katsuyoshi; and Uchiyama, Hiroshi, 4,593,989, Cl. 355-3.00R.
Hijikigawa, Masaya, 4,594,619, Cl. 360-74.400.
Iwagami, Fusao, 4,594,598, Cl. 346-140.00R.
Kawaguchi, Masashi; Isaka, Kinichi; Endo, Yoshihiro; and Kishishita, Hiroshi, 4,594,282, Cl. 428-216.000.
Ohba, Toshihiro; Kinoshita, Hiroshi; Kanatani, Yoshiharu; and Uede, Hisashi, 4,594,589, Cl. 340-805.000.
Ohta, Tomozo, 4,594,556, Cl. 329-137.000.
Takamatsu, Toshiaki; Funada, Fumiaki; Matsuura, Masataka; and Uchida, Tatuo, 4,593,977, Cl. 350-339.00F.
Tamagaki, Akira, 4,594,536, Cl. 318-561.000.
Yoshida, Kunio, 4,594,686, Cl. 364-900.000.
Sharpless, Karl B.: *See*—
Katsuki, Tsutomu; and Sharpless, Karl B., 4,594,439, Cl. 549-523.000.
Shaver, Michael A.: *See*—
Liu, Dean-Yuan; Guy, Jon S.; Siu, Howard W. H.; and Shaver, Michael A., 4,594,597, Cl. 346-76.0PH.
Shay, Charles W. Carrying case for canoe. 4,593,642, Cl. 114-347.000.
Sheeks, Perry: *See*—
Miller, Gary E.; and Sheeks, Perry, 4,593,646, Cl. 119-1.000.
Shell Oil Company: *See*—
Dong, Walter; and Petty, Walter L., 4,594,198, Cl. 558-351.000.
Kollmeyer, Willy D., 4,594,094, Cl. 71-88.000.
Minderhoud, Johannes K.; and Sie, Swan T., 4,594,468, Cl. 585-310.000.
Sie, Swan T., 4,594,172, Cl. 252-55.000.
Stoutamire, Donald W.; and Dong, Walter, 4,594,196, Cl. 558-351.000.
Shelly, William A.: *See*—
Guenthner, Russell W.; Shelly, William A.; Presley-Nelson, Gary R.; Marietta, Kala J.; and Wade, R. Morse, 4,594,659, Cl. 364-200.000.
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Abdou-Sabet, Sabet; and Shen, Kuo-Shein, 4,594,390, Cl. 525-232.000.
Sheridan, David S.; and Jackson, Isaac S., to Sheridan, David S. Endotracheal tubes with improved proximal end connector units. 4,593,690, Cl. 128-207.150.
Sherritt Gordon Mines Limited: *See*—
Weir, Donald R.; Kerfoot, Derek E.; and Chalkley, Michael E., 4,594,102, Cl. 75-119.000.
Shiba, Haruo: *See*—
Sato, Takateru; and Shiba, Haruo, 4,593,868, Cl. 242-199.000.
Shibata, Hirotaka; and Muramatsu, Takayoshi, to Yamaha Hatsukoki Kabushiki Kaisha. Intake system for internal combustion engine. 4,593,656, Cl. 123-52.00M.
Shibata, Takeshi: *See*—
Nakamura, Taku; Hibino, Akira; Shibata, Takeshi; and Nakamura, Koichi, 4,594,308, Cl. 430-213.000.
Shibue, Toshiaki; and Nagayasu, Koichi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic element with electron beam cured interlayer. 4,594,315, Cl. 430-531.000.
Shibuya, Taro: *See*—
Kimura, Kazuo; Mukai, Hiromu; and Shibuya, Taro, 4,593,984, Cl. 354-219.000.
Shigematu, Takashi: *See*—
Sawada, Daisaku; Shigematu, Takashi; and Tokoro, Setsuo, 4,593,582, Cl. 74-866.000.
Shillady, Robert W., to American Electronic Laboratories, Inc. Traveling wave video detector. 4,594,557, Cl. 329-160.000.
Shimizu, Kiyoshi: *See*—
Hayashi, Ikuo; Itikawa, Tadao; and Shimizu, Kiyoshi, 4,594,409, Cl. 528-328.000.
Shimizu, Shunji; Watakabe, Yuichi; Fujiwara, Kunihiko; and Yabumoto, Toshiaki, to Furukawa Electric Co., Ltd., The. Zinc-chloride cell. 4,594,298, Cl. 429-72.000.
Shimizu, Yukiaki; and Oouchi, Kei, to Hitachi, Ltd. Motor vehicle bogie. 4,593,625, Cl. 105-182.00R.
Shimomura, Toshitaka, to Mitutoyo Mfg. Co., Ltd. Digital display measuring apparatus. 4,593,473, Cl. 33-169.00R.
Shimosawa, Katsuo: *See*—
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Shin-Etsu Chemical Co., Ltd.: *See*—
Takahashi, Kozo; Tahaka, Yasuharu; Isobe, Kenichi; and Ichinohe, Shoji, 4,594,401, Cl. 526-279.000.
Shinano, Kunizo: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.
Shinbori, Kenichi; and Ishikawa, Kazuo, to Canon Kabushiki Kaisha. Solid-state imaging device assembly. 4,594,613, Cl. 358-213.000.
Shinko Electric Co., Ltd.: *See*—
Miwa, Zenichiro; and Nakagawa, Hiroshi, 4,594,520, Cl. 310-12.000.
Shinko Machinery Works, Inc.: *See*—
Tanaka, Takeshi, 4,593,731, Cl. 144-1.00A.
Shiota, Toshiaki: *See*—
Nagai, Hiroyuki; Nishihara, Minoru; and Shiota, Toshiaki, 4,594,292, Cl. 428-458.000.
Shirahase, Ichiro: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Murase, Masao; Inoue, Kichiro; and Shirahase, Ichiro, 4,594,345, Cl. 514-234.000.
Shirakawa, Hideki: *See*—
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Shiratori, Harunori; Ishikawa, Masaru; and Kato, Hisami, to Toyota Jidosha Kabushiki Kaisha. Vehicle height adjustment system providing uniform height control. 4,593,931, Cl. 280-714.000.
Shiuey, Shian-Jan: *See*—
Partridge, John J.; Shiuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., 4,594,340, Cl. 514-167.000.
Shoji, Makoto; and Sakai, Yoshiaki, to Teac Corporation. Disk storage file with a four phase, single phase drive stepping motor. 4,594,620, Cl. 360-75.000.
Shoji, Tatsuo: *See*—
Naka, Hiromitsu; Okushima, Takehiko; and Shoji, Tatsuo, 4,593,493, Cl. 49-248.000.
Shoop, James D.: *See*—
Lankard, David R.; and Shoop, James D., 4,593,627, Cl. 109-83.000.
Shoup, Walter C., II, to Autographic Business Forms, Inc. Large scale X-Y plotting table. 4,593,469, Cl. 33-1.00M.
Showa Denko K.K.: *See*—
Kobayashi, Yukio; Shirakawa, Hideki; and Ikeda, Sakuji, 4,594,180, Cl. 252-500.000.
Showa Denko Kabushiki Kaisha: *See*—
Hamada, Yoshinori, 4,594,376, Cl. 524-101.000.
Sidler, Thomas; and Gasser, Daniel, to Compagnie Industrielle Radioelectrique. Copperplate printing detection method and device therefor. 4,594,514, Cl. 250-556.000.
Sidney, LuAnn: *See*—
Kreil, Curtis L.; and Sidney, LuAnn, 4,594,262, Cl. 427-44.000.
Sie, Swan T., to Shell Oil Company. Process for the preparation of hydrocarbons. 4,594,172, Cl. 252-55.000.
Sie, Swan T.: *See*—
Minderhoud, Johannes K.; and Sie, Swan T., 4,594,468, Cl. 585-310.000.
Siemens Aktiengesellschaft: *See*—
Eue, Wolfgang; and Strelow, Horst, 4,594,681, Cl. 364-900.000.
Hermann, Adam, 4,594,643, Cl. 361-386.000.
Mair, Eduard; and Zoeke, Siegfried, 4,593,480, Cl. 34-78.000.
Schott, Heinrich, 4,594,541, Cl. 323-288.000.
Siemens-Allis, Inc.: *See*—
DiMarco, Bernard; and Stanford, Charles W., 4,594,567, Cl. 335-16.000.
Signetics Corporation: *See*—
Yarborough, John M., Jr., 4,594,564, Cl. 331-1.00A.
Sigri GmbH: *See*—
Boder, Horst, 4,594,722, Cl. 373-91.000.
Sikorski, James A.; and Schafer, David E., to Monsanto Co. Triester derivatives of N-phosphonomethylthionoglycine as herbicides. 4,594,093, Cl. 71-87.000.
Silverberg, Morton, to Xerox Corporation. Bottom stacking with air knife levitation and articulating seals. 4,593,897, Cl. 271-212.000.
Silvey, Dorrel R.: *See*—
Bracht, Roger R.; and Silvey, Dorrel R., 4,594,717, Cl. 372-38.000.
Simm, Wolfgang; and Steine, Hans-Theo, to Castolin S.A. Powdered nickel-chromium based material for thermal spraying. 4,594,103, Cl. 75-128.00C.
Simms, David W., to Sangamo Weston Limited. Digital signature plug. 4,593,959, Cl. 339-17.00C.
Simon, Arno; and Gast, Jurgen, to Bruker Analytische Messtechnik GmbH. Infrared spectrometer. 4,594,509, Cl. 250-338.000.
Simon, Gene F., to Kimberly-Clark Corporation. Method and seam construction to significantly reduce seam leakage. 4,593,418, Cl. 2-275.000.
Simons, Brian H.: *See*—
Viskochil, Stephen R.; and Simons, Brian H., 4,594,627, Cl. 360-105.000.
Singer Company, The: *See*—
Schindel, Arnold, 4,593,576, Cl. 74-424.80B.
Singleton, Arthur M., to Hi-Shear Corporation. Torque tool adapted to set a fastener and to secure and retain fastener fragments. 4,593,583, Cl. 81-57.140.
Sinn, Hartmut; Breymaier, Hermann; and Mutschler, Gunter, to Neuweg Fertigung GmbH. Torque-dependent pressure mechanism for continuously adjustable ball-type planetary gear set. 4,593,574, Cl. 74-198.000.
Sipla, Vaclav A. Vehicle lifting devices. 4,594,048, Cl. 414-678.000.
Sirefelt, Lars. Device in a rotating shaft supporting bearing element. 4,593,811, Cl. 198-842.000.
Siu, Howard W. H.: *See*—
Liu, Dean-Yuan; Guy, Jon S.; Siu, Howard W. H.; and Shaver, Michael A., 4,594,597, Cl. 346-76.0PH.
Siuta, Vincent P., to Du Pont de Nemours, E. I., and Company. Metal oxide-coated copper powder. 4,594,181, Cl. 252-512.000.

Skeie, Bjarne E., to Maritime Hydraulics A.S. Well drilling assembly. 4,593,773, Cl. 175-85.000.

SKF Steel Engineering AB: *See—*
Eriksson, Sune, 4,594,236, Cl. 423-441.000.

Skog, Erik, to United Stirling AB. Method of connecting elements by brazing. 4,593,851, Cl. 228-248.000.

Skonieczny, Joseph P.: *See—*
Arifian, Kenneth C.; and Skonieczny, Joseph P., 4,594,537, Cl. 318-564.000.

Skotsch, Carlo; Baumert, Dietrich; and Krahmer, Hansjorg, to Schering Aktiengesellschaft. Biocidal azolyl-propane nitriles. 4,594,095, Cl. 71-92.000.

Skovdal, Jorgen: *See—*
Goeller, Loretta D.; and Skovdal, Jorgen, 4,593,708, Cl. 132-9.000.

Slaats, Mathew A.; and Strange, Patrick E., to Kimball International, Inc. Hydraulic chair lift mechanism. 4,593,951, Cl. 297-347.000.

Sloan-Kettering Institute for Cancer Research: *See—*
Lopez, Carlos; Watanabe, Kyoichi A.; Reichman, Uri; and Fox, Jack J., 4,594,339, Cl. 514-42.000.

Sloan Valve Company: *See—*
Schmitt, Eugene W., 4,593,797, Cl. 188-196.00D.

Smith, Daniel P.: *See—*
Moore, Ryan C.; and Smith, Daniel P., 4,593,901, Cl. 272-78.000.

Smith, David E. Recoil spring system for self loading fire arms. 4,593,601, Cl. 89-199.000.

Smith, Eugene; and Posluszny, Thomas, to United Technologies Corporation. Uniform field generating eddy current testing processing method and apparatus. 4,594,549, Cl. 324-232.000.

Smith International, Inc.: *See—*
Chaney, John P.; and Van De Nobelen, William, 4,593,775, Cl. 175-228.000.
Salesky, William J.; Ecer, Gunes M.; and Kuhn, Karl O., 4,593,776, Cl. 175-375.000.

Smith, James A.; and Murphy, Betty J., to Creative Products Resource Associates, Ltd. Friable foam textile cleaning stick. 4,594,362, Cl. 521-52.000.

Smith, John W.: *See—*
Dziubakowski, Donald J.; and Smith, John W., 4,593,477, Cl. 34-10.000.

Smith & Loveless, Inc.: *See—*
Weis, Frank G., 4,594,153, Cl. 210-104.000.

Smith, Robert F.; and Bemis, Claude, to Ex-Cell-O Corporation. Device for supporting a preform insert in a mold. 4,593,880, Cl. 249-91.000.

Smith, Todd R., to GTE Products Corporation. Space frame. 4,593,514, Cl. 52-648.000.

Smudin, David J.: *See—*
Loveless, Frederick C.; Merijanian, Aspet V.; Smudin, David J.; and Nudenberg, Walter, 4,594,469, Cl. 585-511.000.

Snam S.p.A.: *See—*
Ferrari Aggradi, Gian P.; and Bonfiglioli, Giampaolo, 4,593,448, Cl. 29-523.000.
Ferrari Aggradi, Gian P.; and Bonfiglioli, Giampaolo, 4,593,917, Cl. 277-30.000.

Snook, Martin; Rideout, James M.; and Renshaw, Alan, to National Research Development Corp. Device for analyzing chemical substance. 4,594,533, Cl. 315-363.000.

Snyder, David A.; and Glosecki, David M., to Westinghouse Electric Corp. Apparatus and process for refurbishing valves. 4,593,445, Cl. 29-157.10R.

Snyder, Fred W.: *See—*
Scholten, Pieter C.; Snyder, Fred W.; and Sorkin, Howard, 4,594,271, Cl. 427-221.000.

Sobstad Sailmakers, Inc.: *See—*
Conrad, Peter G., 4,593,639, Cl. 114-103.000.

Societe Avitex: *See—*
Lilienthal, Johannes H., 4,593,836, Cl. 222-136.000.

Societe d'Etude et de Construction de Meteurs d'Aviation S.N.E.C.-M.A.: *See—*
Denise, Rene ; and Moreau, Francis, 4,593,938, Cl. 285-22.000.

Societe d'Etudes Scientifiques et Industrielles de L'ile-de-France: *See—*
Thominet, Michel L.; and Franceschini, Jacqueline F., 4,594,428, Cl. 548-570.000.

Societe Nationale Elf Aquitaine: *See—*
Schawann, Jean C.; Caumont, Jean P.; and Falcimaigne, Jean, 4,593,937, Cl. 285-18.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Delourme, Raymond; Detienne, Jean-Louis; Komornicki, Jacques; and Tellier, Jacques, 4,594,151, Cl. 209-166.000.
Levesque, Guy; and Tozzolino, Pierre, 4,594,150, Cl. 209-166.000.

Societe pour d'Etude et la Fabrication de Circuits Integres Speciaux EFCS: *See—*
Baudrant, Annie; and Marty, Michel, 4,593,454, Cl. 29-571.000.

Sohngen, Joachim, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Housing for a fluid flow or jet engine. 4,594,053, Cl. 415-174.000.

Sokolik, Joseph E., Jr.: *See—*
Blake, Robert J.; and Sokolik, Joseph E., Jr., 4,594,076, Cl. 44-6.000.

Sommargren, Gary E., to Zygo Corporation. Interferometric wavefront measurement. 4,594,003, Cl. 356-349.000.

Sommer, Wayne D.: *See—*
Tappe, Gale R.; and Sommer, Wayne D., 4,593,806, Cl. 198-369.000.

Sone, Humiki: *See—*
Kobayashi, Kenji; Yasuda, Tsutomu; Matsumoto, Hiroshi; and Sone, Humiki, 4,593,701, Cl. 128-667.000.

Soni, Prasanna L. Stabilizing device for use in arthroscopic and endoscopic surgery. 4,593,681, Cl. 128-4.000.

Sony Corporation: *See—*
Nemoto, Shoji; and Yoshioka, Hiroshi, 4,594,615, Cl. 360-10.200.

Soot, Olaf. Rotating truck lift. 4,594,044, Cl. 414-263.000.

Sorgeloos, Patrick P.; Versichele, Danny H.; Leger, Philippe P. J. M.; and Lavens, Patrick A., to Artemia N.V. Method and device of producing artemia offspring. 4,593,647, Cl. 119-2.000.

Sorkin, Howard: *See—*
Scholten, Pieter C.; Snyder, Fred W.; and Sorkin, Howard, 4,594,271, Cl. 427-221.000.

Sosio, Alberta: *See—*
Bellani, Piero; Clavenna, Gaetano; Sosio, Alberta; and Pellegrini, Rinaldo, 4,594,421, Cl. 546-121.000.

Sota, Kaoru: *See—*
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; Nakashima, Yoshimoto; and Sota, Kaoru, 4,594,197, Cl. 558-255.000.

South African Inventions Development Corporation: *See—*
Eriksson, Andrew J.; and Kuhn, Patrick C., 4,594,543, Cl. 324-72.000.

Southwire Company: *See—*
Baldassari, Giuseppe, 4,594,119, Cl. 156-94.000.

Sowade, Bernd: *See—*
Grimm, Robert; and Sowade, Bernd, 4,594,105, Cl. 75-257.000.

Spangler, Anthony G.; and Myers, Kenneth E., to Masco Corporation of Indiana. Quick connect fitting for a faucet handle and the like. 4,593,430, Cl. 16-121.000.

Spargo, Thomas W.: *See—*
Arute, William J.; Spargo, Thomas W.; and Ambler, Edward C., 4,593,945, Cl. 292-201.000.

Specialty Packaging Products, Inc.: *See—*
Bennett, Robert A., 4,593,607, Cl. 92-130.00B.

Spectro Industries, Inc.: *See—*
Wolpert, George H., Jr.; and Sebest, Albert E., 4,593,422, Cl. 5-503.000.

Speedfam Corporation: *See—*
Cesna, Joseph V., 4,593,716, Cl. 137-561.00A.

Speer, Robert J.; and Stewart, David P., to Bristol-Myers Company. Antitumor platinum complexes. 4,594,418, Cl. 544-225.000.

Speltz, Laurine M.; Walworth, Bryant L.; and Pavlista, Alexander D., to American Cyanamid Company. Substituted nitro and cyanoguanidines and their use of increasing crop yields. 4,594,092, Cl. 71-77.000.

Sperling, Karin: *See—*
Wilke, Gunther; Sperling, Karin; and Stehling, Ludwig, 4,594,447, Cl. 560-202.000.

Sperry Corporation: *See—*
Schomburg, John R.; and Bushard, Louis B., 4,594,680, Cl. 364-765.000.

Spie Batignolles: *See—*
Betton, Claude, 4,594,480, Cl. 179-175.30R.

Spietschka, Ernst; and Troster, Helmut, to Hoechst Aktiengesellschaft. Perylene-3,4,9,10-tetracarboxylic acid monoanhydride monoimide and monoimidazolide compounds, processes for their preparation and their use. 4,594,420, Cl. 546-29.000.

Spiker, Michael G., to Planet Corporation. Power and free conveyor. 4,593,624, Cl. 104-172.00B.

Spinner, Georg. Connecting device for coaxial cables. 4,594,474, Cl. 174-88.00C.

Square D Starkstrom GmbH: *See—*
Lemmer, Helmut, 4,594,484, Cl. 200-16.00A.

SRI International: *See—*
Cooper, David E.; and Gallagher, Thomas F., 4,594,511, Cl. 250-339.000.

Srivastava, Prem C.: *See—*
Robins, Roland K.; and Srivastava, Prem C., 4,594,414, Cl. 536-18.700.
Robins, Roland K.; and Srivastava, Prem C., 4,594,416, Cl. 536-121.000.

Staffa, Karl-Heinz: *See—*
Humpolik, Bohumil; Ingelmann, Hans-Joachim; and Staffa, Karl-Heinz, 4,593,539, Cl. 62-504.000.

Stafford, Robert; and Cook, Gregory, to Fabric and Structure Technology, Inc. Framed tension structure. 4,593,710, Cl. 135-102.000.

Stahl, Hans-Georg; Schwindt, Jurgen; and Nachtkamp, Klaus, to Bayer Aktiengesellschaft. Process for the production of aqueous dispersions and use thereof for the production of metal effect lacquer coatings. 4,594,374, Cl. 523-501.000.

Stahl, William L., Jr.: *See—*
Moore, Victor S.; Veneski, Gerard A.; Parker, Tony E.; Rhodes, Joseph C., Jr.; Kraft, Wayne R.; and Stahl, William L., Jr., 4,594,661, Cl. 364-200.000.

Stahlhofen, Paul; and Beutel, Rainer, to Hoechst Aktiengesellschaft. Light-sensitive copying material with o-quinone diazide and phenolic hydroxy compound. 4,594,306, Cl. 430-166.000.

Stahnke, Wayne L., to Kimball International, Inc. Method and apparatus for altering actuator drive in a reproducing piano. 4,593,592, Cl. 84-21.000.

Stalberg, Ralph I., to Pharmacia AB. Process and apparatus for applying back pressure in a liquid chromatography system. 4,594,159, Cl. 210-198.200.

Stalder, Herbert; and Briner, Emil, to Rieter Machine Works Limited. Jet spinning device. 4,593,521, Cl. 57-328.000.

Standard Oil Company, The: *See*—
Dilts, David A.; and Hartman, Robert A., 4,593,455, Cl. 29-572.000.
Lambert, Joseph M., Jr.; and Paspek, Stephen C., Jr., 4,594,228, Cl. 422-218.000.
Paspek, Stephen C., Jr.; and Coker, Curtis D., 4,594,141, Cl. 208-390.000.
Read, Randol R.; and Supernaw, John W., 4,594,692, Cl. 367-13.000.
Stanek, Wolfram: *See*—
Hubner, Klaus-Dieter; Oettinghaus, Dieter; and Stanek, Wolfram, 4,594,568, Cl. 335-289.000.
Stanford, Charles W.: *See*—
DiMarco, Bernard; and Stanford, Charles W., 4,594,567, Cl. 335-16.000.
Stanley Works, The: *See*—
Arute, William J.; Spargo, Thomas W.; and Ambler, Edward C., 4,593,945, Cl. 292-201.000.
Stauss, Eberhard; Klein, Hans-Rudolf; and Thalmeir, Alfons, to Dyckerhoff & Widmann AG. Construction component for producing of preferred shot-in structures. 4,593,498, Cl. 52-18.000.
Steckler, Thomas M., to Burroughs Corporation. Hierarchy of control stores for overlapped data transmission. 4,594,658, Cl. 364-200.000.
Steensen, Wayne L.: *See*—
Wilson, Mildred N.; and Steensen, Wayne L., 4,594,255, Cl. 426-578.000.
Stefanek, Ronald T., to Folger Adam Company. Security lock. 4,593,543, Cl. 70-134.000.
Stefani, Giancarlo: *See*—
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, 4,594,433, Cl. 549-256.000.
Stehling, Ludwig: *See*—
Wilke, Gunther; Sperling, Karin; and Stehling, Ludwig, 4,594,447, Cl. 560-202.000.
Steine, Hans-Theo: *See*—
Simm, Wolfgang; and Steine, Hans-Theo, 4,594,103, Cl. 75-128.00C.
Stendahl, Gunnar, to AB Asea-Atom. Pressure-reducing valve. 4,593,478, Cl. 34-57.00R.
Stewart, David B.: *See*—
Preston, Edward G.; and Stewart, David B., 4,593,706, Cl. 131-109.100.
Stewart, David P.: *See*—
Speer, Robert J.; and Stewart, David P., 4,594,418, Cl. 544-225.000.
Stewart, Robert, to Wink Corporation. Attachment device for relatively permanently attaching a structure to a supporting surface. 4,593,878, Cl. 248-549.000.
Stich, Bodo; Hassler, Ernst; Adamowicz, Slawomir; and Cyphelly, Ivan J., to GLYCO-Antriebstechnik GmbH. Hydraulic controllable two-port valve for a liquid stream. 4,593,715, Cl. 137-503.000.
Still GmbH: *See*—
Krohling, Erich, 4,593,779, Cl. 180-65.400.
Stine, Charles R. Aspiration syringe holder. 4,594,073, Cl. 604-187.000.
Stirling, David I.: *See*—
Dalton, Howard; Colby, John; and Stirling, David I., 4,594,324, Cl. 435-123.000.
Stoddard, Elizabeth J. Calculator for harmonizing colors. 4,594,070, Cl. 434-104.000.
Stoddard, Lawrence M.: *See*—
Carlson, James A.; and Stoddard, Lawrence M., 4,593,491, Cl. 49-13.000.
Stokes, Vijay K., to General Electric Company. Rotatable assembly for a dynamoelectric machine. 4,594,525, Cl. 310-156.000.
Stolz, Gerd, to Matter, Winfried. Elongated columnar or rod-like structure, and method of its manufacture. 4,594,275, Cl. 428-36.000.
Stone, Nancy L.: *See*—
Boulia, Dorothy I.; Pousson, Michael W., Jr.; Pring, Edward J.; and Stone, Nancy L., 4,594,674, Cl. 364-523.000.
Stoppels, Doeko; Boonen, Peter G. T.; Enz, Ulrich E.; and van Hoof, Leonardus A. H., to U.S. Philips Corporation. Magnetic head having cobalt-containing zinc-ferrous ferrite core. 4,594,628, Cl. 360-125.000.
Stord Bartz A/S: *See*—
Berge, Odd; and Hovland, Helge, 4,593,614, Cl. 99-538.000.
Stormberg, Hans P.: *See*—
Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., 4,594,531, Cl. 315-307.000.
Stoutamire, Donald W.; and Dong, Walter, to Shell Oil Company. Preparation of optically active alpha-hydroxynitriles. 4,594,196, Cl. 558-351.000.
Strahle, Werner: *See*—
Meyers, Richard F.; Rossi, Francis; and Strahle, Werner, 4,594,690, Cl. 365-230.000.
Stranahan, Michael: *See*—
Lew, Hyok S.; and Stranahan, Michael, 4,593,787, Cl. 182-3.000.
Strange, Patrick E.: *See*—
Slaats, Mathew A.; and Strange, Patrick E., 4,593,951, Cl. 297-347.000.
Stratton, Frank. Building block or panel. 4,593,513, Cl. 52-578.000.
Strazzolini, Paolo; Malabarba, Adriano; and Cavalleri, Bruno, to Gruppo Lepetit S.p.A. Process for preparing antibiotic L 17054. 4,594,187, Cl. 530-332.000.
Streifer, William: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,594,718, Cl. 372-45.000.
Strelow, Horst: *See*—
Eue, Wolfgang; and Strelow, Horst, 4,594,681, Cl. 364-900.000.
Stromme, Sigurd J., to Årdal Og Sunndal Verk A.S. Differential mandrel for sheet-slitting machine recoiler. 4,593,864, Cl. 242-56.900.
Struckman, Keith A., to Sanders Associates, Inc. Circular log-periodic direction-finder array. 4,594,595, Cl. 343-770.000.
Studiengesellschaft Kohle mbH: *See*—
Wilke, Gunther; Sperling, Karin; and Stehling, Ludwig, 4,594,447, Cl. 560-202.000.
Sturm, Ruger & Company, Inc.: *See*—
Ruger, William B.; and Melcher, Roy L., 4,593,487, Cl. 42-7.000.
Ruger, William B., 4,593,488, Cl. 42-75.00C.
Suave Shoe Corporation: *See*—
Moreno, Rodolfo, 4,593,634, Cl. 112-262.300.
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, to Lummus Crest, Inc.; and Alusuisse Italia S.p.A. Production of maleic anhydride. 4,594,433, Cl. 549-256.000.
Sudo, Michio, to Kangyo Denkikiki Kabushiki Kaisha. Coreless-brushless motor. 4,594,524, Cl. 310-68.00R.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Humpolik, Bohumil; Ingelmann, Hans-Joachim; and Staffa, Karl-Heinz, 4,593,539, Cl. 62-504.000.
Sugibayashi, Kiyoshi; Oguchi, Tomihiro; and Takahori, Hiroyuki, to Pioneer Electronic Corporation. Station selecting method for television receiver. 4,594,611, Cl. 358-191.100.
Sugimoto, Koichi; Koizumi, Kiyohide; Hamada, Toyohide; and Arai, Shinichi, to Hitachi, Ltd. Velocity method of controlling industrial robot actuators. 4,594,671, Cl. 364-513.000.
Sugimoto, Naoyuki, to Takigen Seizou Co. Ltd. Photoelectric key switch device with notched rotor. 4,594,505, Cl. 250-229.000.
Sugishita, Susumu: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,594,062, Cl. 418-173.000.
Sugiura, Noboru: *See*—
Sasaki, Shoji; Mori, Yasunori; and Sugiura, Noboru, 4,593,667, Cl. 123-488.000.
Sugiyama, Toshimasa: *See*—
Endo, Takayoshi; Sugiyama, Toshimasa; Murofushi, Satoru; and Yagi, Sakai, 4,593,963, Cl. 339-97.00R.
Sulzer Brothers Limited: *See*—
Pfarrwaller, Erwin, 4,593,724, Cl. 139-188.00R.
Sumida, Morimasa: *See*—
Miyazaki, Kazuhide; and Sumida, Morimasa, 4,594,301, Cl. 429-228.000.
Sumitomo Chemical Company, Limited: *See*—
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,594,379, Cl. 524-114.000.
Hashimoto, Tadanori; Yoshitake, Hiroshi; Yokoyama, Hiroyuki; and Nakazono, Akiko, 4,594,182, Cl. 252-518.000.
Sumitomo Electric Industries, Ltd.: *See*—
Harano, Fumio; Kaneta, Shigeyoshi; Nakagaki, Kunihiro; and Nishiyama, Satoshi, 4,594,124, Cl. 156-468.000.
Osawa, Yoshitaka; Nishimura, Akira; Morimi, Junki; and Tobe, Mitsunobu, 4,594,285, Cl. 428-240.000.
Yoshida, Kenichi; Ono, Kimizo; and Tsuno, Koichi, 4,593,973, Cl. 350-96.290.
Sumitomo Heavy Industries, Ltd.: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.
Sumitomo Metal Chemical Co., Ltd.: *See*—
Nagai, Hiroyuki; Nishihara, Minoru; and Shiota, Toshiaki, 4,594,292, Cl. 428-458.000.
Sumitomo Metal Industries, Ltd.: *See*—
Nagai, Hiroyuki; Nishihara, Minoru; and Shiota, Toshiaki, 4,594,292, Cl. 428-458.000.
Sun Refining and Marketing Company: *See*—
Hosler, Peter, 4,594,148, Cl. 208-332.000.
Sundman, Peter: *See*—
Larsson, Goran; and Sundman, Peter, 4,594,018, Cl. 403-43.000.
Supernaw, John W.: *See*—
Read, Randol R.; and Supernaw, John W., 4,594,692, Cl. 367-13.000.
Suter, Walter. Method and apparatus for sequentially advancing and cutting forms from two continuous form-webs. 4,593,893, Cl. 270-52.500.
Sutt, Robert F., Jr., to Calgon Carbon Corporation. Use of carbon molecular sieves for separating gas or liquid mixtures. 4,594,163, Cl. 210-660.000.
Sutton Engineering Co.: *See*—
Huertgen, Helmut B., 4,593,552, Cl. 72-255.000.
Suzuki, Hirosuke; Kobayashi, Satoru; and Shimosawa, Katsuo, to Junkosha Co. Ltd. Liquid leak sensor. 4,594,638, Cl. 361-280.000.
Suzuki, Kijiro: *See*—
Takahashi, Yoshiharu; and Suzuki, Kijiro, 4,593,987, Cl. 354-402.000.
Suzuki, Mikio: *See*—
Honaga, Susumu; Suzuki, Mikio; and Inaguma, Yoshiharu, 4,593,783, Cl. 180-141.000.
Suzuki, Nitaro: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.
Suzuki, Osamu; Ishizaki, Kanjiro; and Ozawa, Seiichi, to Chichibu Cement Co., Ltd.; and Ozawa Concrete Industry Co., Ltd. Multiplex

design container having a three-layered wall structure and a process for producing the same. 4,594,513, Cl. 250-506.100.
Suzuki, Shoichi; Kurobe, Moriji; Araga, Toshima; and Hiruta, Osamu, to Kabushiki Kaisha Toyota Chou Kenkyusho. Method for preventing filiform corrosion on metal surfaces. 4,594,112, Cl. 148-6.14R.
Suzuki, Takashi; Kawakami, Takamasa; Koyama, Takeshi; Orisaku, Masami; Izaki, Kansei; Nakano, Rieko; and Mori, Akira, to Mitsubishi Gas Chemical Company, Inc. Fine amorphous powder and process for preparing fine powdery mixture of silicon nitride and silicon carbide. 4,594,330, Cl. 501-92.000.
Svensson, Sven-Eric A. Anchoring device for posts for fences, guardrails, tents etc. 4,593,872, Cl. 248-156.000.
Swedlow, Inc.: *See*—
Fischer, William F.; LeMasters, Donald P.; and Harbison, William C., 4,594,290, Cl. 428-212.000.
Swithenbank, Colin: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,594,100, Cl. 71-124.000.
Syntech International, Inc.: *See*—
Graves, Gordon T., 4,593,904, Cl. 273-1.00E.
Syntex (U.S.A.) Inc.: *See*—
Zuk, Robert F., 4,594,327, Cl. 436-514.000.
System Homes Company, Ltd.: *See*—
Yoshino, Hozo, 4,593,881, Cl. 251-124.000.
Systemate Holland B.V.: *See*—
Hazenbroek, Jacobus E., 4,593,432, Cl. 17-46.000.
Tabak, Samuel A., to Mobil Oil Corporation. Process for reacting light olefins and jet fuel. 4,594,143, Cl. 208-46.000.
Tabasky, Marvin J.: *See*—
Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., 4,593,459, Cl. 29-577.00C.
Tabata, Youichiro: *See*—
Ueguri, Shigeo; Tabata, Youichiro; Komura, Hirotsugu; and Ito, Toshio, 4,594,498, Cl. 219-137.0PS.
Tachida, Hiroki; Sato, Takane; and Sato, Shigeaki, to Nippon Gakki Seizo Kabushiki Kaisha. Housing for upright pianos. 4,593,594, Cl. 84-185.000.
Tachita, Ryobun: *See*—
Hayakawa, Yoshihiro; Nakamura, Yasuhiro; Tachita, Ryobun; and Yano, Tsutomu, 4,593,700, Cl. 128-663.000.
Tadauchi, Masaharu: *See*—
Kanzaki, Minoru; Komiya, Kazumi; Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, 4,594,733, Cl. 382-50.000.
Tahaka, Yasuharu: *See*—
Takahashi, Kozo; Tahaka, Yasuharu; Isobe, Kenichi; and Ichinohe, Shoji, 4,594,401, Cl. 526-279.000.
Tahara, Yasuteru: *See*—
Nakauchi, Jun; and Tahara, Yasuteru, 4,593,975, Cl. 350-96.340.
Taisei Corporation: *See*—
Kobayashi, Hiroshi; Yasunaga, Toshio; Muro, Toshihiko; Takeda, Fumio; and Tsuruta, Yutaka, 4,593,499, Cl. 52-126.600.
Sakamoto, Osamu; Tsuruta, Yasuhiko; Sasaki, Haruo; Tsukamoto, Yasuo; and Kudo, Kiyoshi, 4,594,005, Cl. 366-177.000.
Taisho Pharmaceutical Co., Ltd.: *See*—
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; Nakashima, Yoshimoto; and Sota, Kaoru, 4,594,197, Cl. 558-255.000.
Tajima, Katsuichirou; and Matsuda, Kosei, to Nihon Radiator Co., Ltd. Air conditioner for automobile. 4,593,852, Cl. 237-12.30A.
Takada, Yusaku: *See*—
Yoshinaga, Kenji; and Takada, Yusaku, 4,593,992, Cl. 355-3.0FU.
Takahashi, Hidenao: *See*—
Hatakeyama, Hideharu; and Takahashi, Hidenao, 4,594,055, Cl. 417-269.000.
Takahashi, Hideyuki; Kenmotsu, Isami; Okajima, Takahiro; and Takahashi, Yoshio, to Pioneer Electronic Corporation. Automatic disc player system with disc selecting and loading means. 4,594,700, Cl. 369-39.000.
Takahashi, Kozo; Tahaka, Yasuharu; Isobe, Kenichi; and Ichinohe, Shoji, to Shin-Etsu Chemical Co., Ltd.; and Toyo Contact Lens Co., Ltd. Oxygen permeable hard contact lens formed from styrene monomer containing a silyl or siloxane group. 4,594,401, Cl. 526-279.000.
Takahashi, Tadashi; Miyashita, Kunio; Kawamata, Syooichi; and Morinaga, Shigeki, to Hitachi, Ltd. Multi phase magnetic sensor apparatus for detecting the position of moving member. 4,594,548, Cl. 324-208.000.
Takahashi, Tsunehiko; and Yoneya, Sigenori, to Fuji Photo Filmco., Ltd. Laser beam recording method. 4,594,596, Cl. 346-76.00L.
Takahashi, Yoshiharu; and Suzuki, Kijiro, to Konishiroku Photo Industry Co., Inc. Method and device for automatic exposure control by programs. 4,593,987, Cl. 354-402.000.
Takahashi, Yoshio: *See*—
Takahashi, Hideyuki; Kenmotsu, Isami; Okajima, Takahiro; and Takahashi, Yoshio, 4,594,700, Cl. 369-39.000.
Takahashi, Youichi; Kashiwakura, Koji; Morisawa, Junichiro; and Kobayashi, Masahiro, to Hitachi, Ltd. Image processing welding control method. 4,594,497, Cl. 219-130.210.
Takahashi, Yutaka: *See*—
Yamasaki, Teiichi; and Takahashi, Yutaka, 4,593,867, Cl. 242-181.000.
Takahori, Hiroyuki: *See*—
Sugibayashi, Kiyoshi; Oguchi, Tomihiro; and Takahori, Hiroyuki, 4,594,611, Cl. 358-191.100.
Takakura, Yumiko: *See*—
Satoh, Susumu; Kobayashi, Ichiro; Takakura, Yumiko; and Tamada, Mitsuru, 4,594,243, Cl. 424-78.000.
Takakura, Yutaka: *See*—
Ueda, Akiyoshi; Nagasaki, Fumihiko; Takakura, Yutaka; and Kojima, Shigeru, 4,594,429, Cl. 548-530.000.
Takamatsu, Toshiaki; Funada, Fumiaki; Matsuura, Masataka; and Uchida, Tatuo, to Sharp Kabushiki Kaisha. Cell construction for color liquid crystal display devices. 4,593,977, Cl. 350-339.00F.
Takao, Shoichi: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.
Takasu, Hitoyuki: *See*—
Nobusawa, Hiroshi; Hosoya, Eiji; Imaizumi, Masahiro; and Takasu, Hitoyuki, 4,593,782, Cl. 180-88.000.
Takasugi, Hisashi: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,594,446, Cl. 560-168.000.
Takaya, Takao: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,594,446, Cl. 560-168.000.
Takayama, Nobutoshi: *See*—
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,594,618, Cl. 360-73.000.
Takayama, Suguru: *See*—
Noguchi, Kiyoshi; Kobayashi, Kouji; and Takayama, Suguru, 4,594,296, Cl. 428-610.000.
Takayanagi, Mikio: *See*—
Nakamoto, Yasunobu; Terayama, Toshiro; and Takayanagi, Mikio, 4,593,527, Cl. 60-660.000.
Take, Hermann: *See*—
McVay, James D.; and Take, Hermann, 4,593,743, Cl. 164-416.000.
Takeda Chemical Industries, Ltd.: *See*—
Nishino, Hiroshi; and Aibe, Toshio, 4,594,231, Cl. 423-210.000.
Takeda, Fumio: *See*—
Kobayashi, Hiroshi; Yasunaga, Toshio; Muro, Toshihiko; Takeda, Fumio; and Tsuruta, Yutaka, 4,593,499, Cl. 52-126.600.
Takeda, Mikio; Oh-ishi, Tokuro; Nakajima, Hiromichi; and Nagao, Taku, to Tanabe Seiyaku Co., Ltd. 1,5-benzothiazepine derivative. 4,594,342, Cl. 514-211.000.
Takemasa, Toshihiro: *See*—
Hashimoto, Kazuyoshi; Takemasa, Toshihiro; and Taniguchi, Nobuyuki, 4,593,548, Cl. 72-12.000.
Moriya, Muneo; Takemasa, Toshihiro; and Katayama, Keiichi, 4,593,549, Cl. 72-12.000.
Takeuchi, Hiroshi; Fukushima, Hirotaka; and Majima, Hidekazu, to Kabushiki Kaisha Daikin Seisakusho. Clutch. 4,593,801, Cl. 192-70.150.
Takeuchi, Norio: *See*—
Fujiwara, Kenzo; Takeuchi, Norio; Nakatsuka, Yoji; Horita, Tsuyoshi; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,522, Cl. 310-42.000.
Horita, Tsuyoshi; Nakatsuka, Yoji; Fujiwara, Kenzou; Takeuchi, Norio; Nakanishi, Yuji; and Murasato, Shigeru, 4,594,523, Cl. 310-42.000.
Takeuchi, Toshio: *See*—
Tomisawa, Yoshiaki; Kinoda, Seiji; Fujita, Eiji; Murata, Masanori; Takeuchi, Toshio; and Ogawa, Ken, 4,593,986, Cl. 354-324.000.
Takigen Seizou Co. Ltd.: *See*—
Sugimoto, Naoyuki, 4,594,505, Cl. 250-229.000.
Takimoto, Hiroyuki: *See*—
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,594,618, Cl. 360-73.000.
Takuma, Toshiaki; Tsumura, Takayuki; Tsugiya, Takanori; Murakami, Katsuya; and Nakajima, Yasue, to Kuraray Yuka Co., Ltd. Process for producing terephthalic acid suitable for use in direct polymerization. 4,594,449, Cl. 562-416.000.
Takumi, Nobusuke: *See*—
Honma, Ichiro; Hirai, Masaharu; Amano, Masatoshi; and Takumi, Nobusuke, 4,594,267, Cl. 427-127.000.
Talpo, Gianpietro, to Sace S.p.A. Costruzioni Elettromeccaniche. High-voltage electric switch with arc extinguishing device using self-generation of a quenching pressure. 4,594,488, Cl. 200-148.00R.
Tam, Matthias L.; and Custode, Frank Z., to Rockwell International Corporation. Two-level transistor structures and method utilizing minimal area therefor. 4,593,453, Cl. 29-571.000.
Tamada, Mitsuru: *See*—
Satoh, Susumu; Kobayashi, Ichiro; Takakura, Yumiko; and Tamada, Mitsuru, 4,594,243, Cl. 424-78.000.
Tamagaki, Akira, to Sharp Kabushiki Kaisha. Servomotor speed control in a positioning device. 4,594,536, Cl. 318-561.000.
Tamra, Shigenori. Fuel dispensing nozzle with automatic shut-off valve. 4,593,729, Cl. 141-218.000.
Tamura, Kazutoshi: *See*—
Naganuma, Takeshi; Miyagawa, Natsumi; Ozawa, Toshiyuki; and Tamura, Kazutoshi, 4,594,242, Cl. 424-57.000.
Tamura, Sakae; Hosoya, Masahiro; Matsuo, Takeshi; and Uehara, Tsutomu, to Kabushiki Kaisha Toshiba. Ion flow modulator. 4,593,994, Cl. 355-3.0SC.
Tanabe Seiyaku Co., Ltd.: *See*—
Takeda, Mikio; Oh-ishi, Tokuro; Nakajima, Hiromichi; and Nagao, Taku, 4,594,342, Cl. 514-211.000.
Tanahashi, Haruhiko: *See*—
Kobayashi, Nobuo; and Tanahashi, Haruhiko, 4,593,578, Cl. 74-498.000.

Tanahashi, Toshitaka: *See*—
Yoshino, Muneki; and Tanahashi, Toshitaka, 4,594,573, Cl. 340-62.000.
Tanaka, Katsuyuki; Kimura, Yasuhiro; Kato, Masanori; and Kuwakado, Satosi, to Nippon Soken, Inc. Sound source searching device. 4,594,694, Cl. 367-120.000.
Tanaka, Kunio: *See*—
Yamada, Yoshifumi; Tanaka, Kunio; and Abe, Zenwemon, 4,594,550, Cl. 324-307.000.
Tanaka, Minoru; Niwano, Kazuhisa; Minato, Tetsunori; and Oka, Yastami, to Tateho Kagaku Kogyo Kabushiki Kaisha. Spraying materials containing ceramic needle fiber and composite materials spray-coated with such spraying materials. 4,594,106, Cl. 106-1.120.
Tanaka, Shigeru: *See*—
Boser, Ronald J.; and Tanaka, Shigeru, 4,593,635, Cl. 112-265.200.
Tanaka, Takeshi, to Shinko Machinery Works, Inc. Driving means for rotating spindles for use in a wood working router or the like. 4,593,731, Cl. 144-1.00A.
Tanaka, Yoko: *See*—
DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, 4,594,192, Cl. 260-397.200.
Taniguchi, Nobuyuki: *See*—
Hashimoto, Kazuyoshi; Takemasa, Toshihiro; and Taniguchi, Nobuyuki, 4,593,548, Cl. 72-12.000.
Tanimoto, Tsutomu, to Mazda Motor Corporation. Lower body construction for motor vehicle. 4,593,949, Cl. 296-204.000.
Tanno, Kiyohiko: *See*—
Kanzaki, Minoru; Komiya, Kazumi; Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, 4,594,733, Cl. 382-50.000.
Tappe, Gale R.; and Sommer, Wayne D., to Doboy Packaging Machinery, Inc. Multiple transpositor conveyor system. 4,593,806, Cl. 198-369.000.
Tate, John. Self-contained power supply and support therefor. 4,593,786, Cl. 180-291.000.
Tateho Kagaku Kogyo Kabushiki Kaisha: *See*—
Tanaka, Minoru; Niwano, Kazuhisa; Minato, Tetsunori; and Oka, Yastami, 4,594,106, Cl. 106-1.120.
Tateishi, Akio: *See*—
Yamamoto, Takashi; Nishida, Kozi; and Tateishi, Akio, 4,593,974, Cl. 350-96.340.
Tatsumi, Shuhei: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Shinano, Kunizo; Kuwabara, Takashi; Ito, Masazumi; Aoki, Kaoru; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; and Watanabe, Takashi, 4,593,859, Cl. 241-20.000.
Tatsumi, Tetsuo. Variable capacitor. 4,594,640, Cl. 361-293.000.
Taylor, Glenn A.; and Hoy, Kenneth L., to Union Carbide Corporation. Connected branched polyols and polyurethanes based thereon. 4,594,366, Cl. 521-137.000.
Taylor, James C.: *See*—
Tremain, J. Keith; and Taylor, James C., 4,594,080, Cl. 55-179.000.
Taylor, Richard P.: *See*—
Myers, Kimbrough I.; Blau, Carl C.; and Taylor, Richard P., 4,593,895, Cl. 271-148.000.
Tazawa, Shinichi: *See*—
Kawakami, Hideo; Tazawa, Shinichi; and Endo, Masami, 4,593,495, Cl. 51-118.000.
TDK Corporation: *See*—
Noguchi, Kiyoshi; Kobayashi, Kouji; and Takayama, Suguru, 4,594,296, Cl. 428-610.000.
Yagi, Hiroshi; Fujita, Hisashi; and Harigane, Kotaro, 4,593,462, Cl. 29-740.000.
TDK Electronics Company, Ltd.: *See*—
Sato, Takateru; and Shiba, Haruo, 4,593,868, Cl. 242-199.000.
Teac Corporation: *See*—
Morikawa, Seiichi, 4,594,535, Cl. 318-254.000.
Shoji, Makoto; and Sakai, Yoshiaki, 4,594,620, Cl. 360-75.000.
Teepak, Inc.: *See*—
De Jong, Hugo; and Thijs, Hugo, 4,594,274, Cl. 428-36.000.
Teigen, Bard C., to Combustion Engineering, Inc. Apparatus for fluidizing a particulate material in a conveying gas. 4,593,630, Cl. 110-245.000.
Teikoku Seiyaku Kabushiki Kaisha: *See*—
Kawata, Terushige; and Yamashita, Shinsuke, 4,594,240, Cl. 424-28.000.
Tektronix, Inc.: *See*—
Dumire, Darrell L., 4,593,450, Cl. 29-559.000.
Mitch, John H., 4,594,121, Cl. 156-158.000.
Telford, David W.; and Peat, Thomas S., to United Kingdom Atomic Energy Authority. Ultrasonic inspection of tube to tube plate welds. 4,593,568, Cl. 73-623.000.
Tellier, Jacques: *See*—
Delourme, Raymond; Detienne, Jean-Louis; Komornicki, Jacques; and Tellier, Jacques, 4,594,151, Cl. 209-166.000.
Tenma, Tsutomu: *See*—
Iwashita, Masao; and Tenma, Tsutomu, 4,594,653, Cl. 364-200.000.
Terada, Jiro: *See*—
Fukushima, Fumio; Terada, Jiro; and Nitta, Tsuneharu, 4,594,569, Cl. 338-35.000.
Terasawa, Shizuo: *See*—
Kobayashi, Toshiaki; Terasawa, Shizuo; Akazome, Giichi; and Murai, Koichi, 4,594,167, Cl. 252-3.000.
Terashita, Yutake. Illuminating reflector. 4,594,645, Cl. 362-18.000.
Terauchi, Tsuneo, to Mitsubishi Denki Kabushiki Kaisha. Robot articulation device. 4,594,049, Cl. 414-744.00R.
Terayama, Toshiro: *See*—
Nakamoto, Yasunobu; Terayama, Toshiro; and Takayanagi, Mikio, 4,593,527, Cl. 60-660.000.
Terry, Edmund A.; Burger, Albert J.; and Terry, Peter A., to P. A. Terry Limited. Lever lock safety device. 4,593,545, Cl. 70-269.000.
Terry, Peter A.: *See*—
Terry, Edmund A.; Burger, Albert J.; and Terry, Peter A., 4,593,545, Cl. 70-269.000.
Terstegge, Theodore E. Quick closing vise assembly for milling machine. 4,593,892, Cl. 269-244.000.
Tesmer, Earl B., to Boeing Company, The. Chip extractor bushing. 4,594,031, Cl. 408-72.00B.
Tetra Pak Development: *See*—
Reil, Wilhelm; and Deutschbein, Ulrich, 4,593,730, Cl. 141-258.000.
Texaco Inc.: *See*—
Cox, Percy T.; Warren, Wayne F.; and Nussbaum, Theodore W., 4,594,551, Cl. 324-341.000.
Hoyt, Donald L., 4,593,761, Cl. 166-268.000.
Texas Instruments Incorporated: *See*—
Culley, Paul R.; and Wallace, Steven J., 4,594,501, Cl. 219-492.000.
Thatte, Satish M., 4,594,711, Cl. 371-25.000.
Tezuka, Nobuo, to Canon Kabushiki Kaisha. Method and apparatus for cleaning a recording and/or reproducing head. 4,594,617, Cl. 360-73.000.
Thalmann, Robert. Bicycle sprocket chain cleaner. 4,593,923, Cl. 280-261.000.
Thalmeir, Alfons: *See*—
Stauss, Eberhard; Klein, Hans-Rudolf; and Thalmeir, Alfons, 4,593,498, Cl. 52-18.000.
Thatte, Satish M., to Texas Instruments Incorporated. Universal testing circuit and method. 4,594,711, Cl. 371-25.000.
Thiele, Karl O.; and Toth, Steven L., to Enetronics, Inc. Power cell assembly. 4,593,461, Cl. 29-623.100.
Thijs, Hugo: *See*—
De Jong, Hugo; and Thijs, Hugo, 4,594,274, Cl. 428-36.000.
Thillays, Jacques C., to U.S. Philips Corporation. Display panel having semiconductors crystals. 4,593,485, Cl. 40-452.000.
Thoma, Wilhelm; Noll, Klaus; Nachtkamp, Klaus; Pedain, Josef; and Schroer, Walter, to Bayer Aktiengesellschaft. Coating agents of polyurethane dispersions and the use thereof for top coats and finishes. 4,594,385, Cl. 524-839.000.
Thomas, Alain: *See*—
Servel, Michel; and Thomas, Alain, 4,594,708, Cl. 370-94.000.
Thomas, Charles E.: *See*—
Jaswa, Vijay C.; and Thomas, Charles E., 4,594,651, Cl. 364-131.000.
Thomas Industries, Inc.: *See*—
Calvert, Peter W., 4,593,428, Cl. 15-248.00A.
Thomas, Richard N.: *See*—
Hobgood, Hudson M.; Thomas, Richard N.; and Barrett, Donovan L., 4,594,173, Cl. 252-62.3GA.
Thominet, Michel L.; and Franceschini, Jacqueline F., to Societe d'Etudes Scientifiques et Industrielles de L'ile-de-France. Novel substituted heterocyclic amines and methods of preparation thereof. 4,594,428, Cl. 548-570.000.
Thompson, Benedict D. Dental crown remover. 4,594,069, Cl. 433-157.000.
Thompson, Donald E. Fluid filter. 4,594,138, Cl. 204-302.000.
Thompson, Gregory J.; Lin, Kaung-Far; and Penner, David W., to UOP Inc. Glucose or maltose from starch. 4,594,322, Cl. 435-95.000.
Thompson, Stanley C. Floating alarm unit for pool or spa. 4,594,582, Cl. 340-566.000.
Thomsen, Joelle R.; and Fagerburg, David R., to Eastman Kodak Company. Polyesters and their manufacture from acids and glycol carbonates. 4,594,406, Cl. 528-271.000.
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Garconnat, Michel; and Morgand, Philippe, 4,594,695, Cl. 367-135.000.
Mourey, Bruno; and Hareng, Michel, 4,593,978, Cl. 350-339.00F.
Thorpe, Gary H. G. H.: *See*—
Whitehead, Thomas P.; Thorpe, Gary H. G. H.; Kricka, Larry J.; Gibbons, John E. C.; and Bunce, Roger A., 4,593,728, Cl. 141-98.000.
Thorsett, Eugene D.: *See*—
Cheung, Yak-Fa; Thorsett, Eugene D.; and Patchett, Arthur A., 4,594,341, Cl. 514-211.000.
Thottathil, John K., to E. R. Squibb & Sons, Inc. Method for making phosphinic acid intermediates. 4,594,199, Cl. 260-502.40R.
Thurman, John S. Vehicle motion signalling system. 4,594,574, Cl. 340-71.000.
Tipton, Craig D.; and Grover, Kent B., to Lubrizol Corporation, The. Polymeric compositions, oil compositions containing said polymeric compositions, transmission fluids and hydraulic fluids. 4,594,378, Cl. 524-106.000.
Tipton, Larry J., to Hussmann Corporation. Combined refrigerated and heated food service table. 4,593,752, Cl. 165-48.100.
Tisell, Claes: *See*—
Pettersson, Rolf; and Tisell, Claes, 4,593,620, Cl. 102-372.000.
Titmas, James A. Method and apparatus for conducting chemical reactions at supercritical conditions. 4,594,164, Cl. 210-741.000.
Tobe, Mitsunobu: *See*—
Osawa, Yoshitaka; Nishimura, Akira; Morimi, Junki; and Tobe, Mitsunobu, 4,594,285, Cl. 428-240.000.
Tobias, Samuel; and Messinger, Robert M., to Hayward Industries, Inc. Self-draining hydromassage fitting. 4,593,420, Cl. 4-496.000.

Toja, Emilio; Barone, Domenico; and Baldoli, Emiliana, to Gruppo Lepetit S.p.A. Use of some 2-[2-[4-phenyl-1-piperazinyl]ethyl]-1H-naphth-[1,2-D]imidazole derivatives and their pharmaceutically acceptable salts in the treatment of cardiovascular diseases. 4,594,348, Cl. 514-253.000.

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Sawada, Daisaku; Shigematu, Takashi; and Tokoro, Setsuo, 4,593,582, Cl. 74-866.000.

Tokumitsu, Shigenori, to Tokyo Shibaura Denki Kabushiki Kaisha. Sampling pulse generator. 4,594,516, Cl. 307-269.000.

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Kawakyu, Yoshito; Higuchi, Toyoki; and Ito, Hiroshi, 4,594,528, Cl. 313-503.000.
Kurafuzi, Takamasa, 4,594,625, Cl. 360-96.300.
Nakamura, Kunihiko, 4,593,896, Cl. 271-186.000.
Ohtani, Takayuki; and Iizuka, Tetsuya, 4,594,519, Cl. 307-443.000.
Tokumitsu, Shigenori, 4,594,516, Cl. 307-269.000.
Watanabe, Yoshihiro, 4,594,502, Cl. 235-379.000.
Yahata, Haruki; and Kobayashi, Hiroshi, 4,594,705, Cl. 370-67.000.

Tomalla, Gebhard: *See—*
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Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; Nakashima, Yoshimoto; and Sota, Kaoru, to Taisho Pharmaceutical Co., Ltd. 3-benzoyl-2-mercaptopropionic acid derivatives. 4,594,197, Cl. 558-255.000.

Tomisawa, Norio; and Aoshima, Shinji, to Nippon Gakki Seizo Kabushiki Kaisha. Clock-signal reproducing circuit including voltage controlled oscillator. 4,594,703, Cl. 369-59.000.

Tomisawa, Yoshiaki; Kinoda, Seiji; Fujita, Eiji; Murata, Masanori; Takeuchi, Toshio; and Ogawa, Ken, to Hitachi Chemical Co. Ltd. Apparatus for developing or peeling alkali-type photosensitive film. 4,593,986, Cl. 354-324.000.

Tomita, Satoru, to Ricoh Company, Ltd. Image recording method. 4,594,599, Cl. 346-160.000.

Tomosada, Masahiro: *See—*
Adachi, Hideki; Tomosada, Masahiro; Hirose, Masayuki; Miyata, Masanori; and Komiya, Yutaka, 4,593,999, Cl. 355-55.000.

Tonon, Giancarlo: *See—*
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Toray Industries, Inc.: *See—*
Hagiwara, Satoru; Ishizuka, Ichiro; and Okabe, Kazuo, 4,594,203, Cl. 264-22.000.
Ishizuka, Yasuhiro; Nakayama, Takashi; and Yamagata, Seiichi, 4,593,522, Cl. 57-400.000.

Toray Silicone Company, Limited: *See—*
Hanada, Tsuneo; and Morita, Yoshitsugu, 4,594,134, Cl. 522-99.000.

Toriuchi, Masaharu: *See—*
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Toshiba Machine Co., Ltd.: *See—*
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Toth, Steven L.: *See—*
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Townsend Engineering Company: *See—*
Townsend, Ray T., 4,593,434, Cl. 17-49.000.

Townsend, Greg M.; and Henderson, James A., Jr., to Motorola, Inc. Integrated circuit protection circuit. 4,594,633, Cl. 361-57.000.

Townsend, Ray T., to Townsend Engineering Company. Casing support for product encasing machine and method for using same. 4,593,434, Cl. 17-49.000.

Toyne, Kenneth J.: *See—*
Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidensschink, Rudolf; and Romer, Michael, 4,594,465, Cl. 568-642.000.

Toyo Contact Lens Co., Ltd.: *See—*
Takahashi, Kozo; Tahaka, Yasuharu; Isobe, Kenichi; and Ichinohe, Shoji, 4,594,401, Cl. 526-279.000.

Toyo Engineering Corporation: *See—*
Ohsaki, Kozo; Zanma, Jun; and Watanabe, Hiroshi, 4,594,227, Cl. 422-148.000.

Toyo Rubber Industry Co., LTd., The: *See—*
Okamoto, Shuichi; Kunihiro, Motoo; and Nakajima, Zenji, 4,593,891, Cl. 267-140.100.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Oyama, Kiyotaka; and Harada, Tuneo, 4,594,450, Cl. 362-496.000.

Toyoda Gosei Co., Ltd.: *See—*
Noda, Kazushi, 4,594,486, Cl. 200-61.540.

Toyoda Koki Kabushiki Kaisha: *See—*
Honaga, Susumu; Suzuki, Mikio; and Inaguma, Yoshiharu, 4,593,783, Cl. 180-141.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Haga, Katutoshi; Sasamori, Takehusa; Kurita, Teizi; and Katumata, Noriaki, 4,594,037, Cl. 409-144.000.
Kobayashi, Nobuo; and Tanahashi, Haruhiko, 4,593,578, Cl. 74-498.000.
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,594,101, Cl. 75-0.50C.
Natsume, Kazuyuki; Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, 4,593,920, Cl. 280-6.00R.
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Tozzolino, Pierre: *See—*
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TRE Corporation: *See—*
Rotondi, Anthony J.; Mullich, Richard O.; and Carabet, George F., 4,593,542, Cl. 70-134.000.

Treants, Bill. Tree climbing apparatus. 4,593,789, Cl. 182-142.000.

Tremain, J. Keith; and Taylor, James C., to Normalair-Garrett Holdings Ltd. Molecular sieve type gas separation systems. 4,594,080, Cl. 55-179.000.

Tridon, Max: *See—*
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Dell, Hans-Dieter; Pelster, Bernhard; Kraus, Reinhold; and Schierstedt, Detlef, 4,594,357, Cl. 514-537.000.

Troster, Helmut: *See—*
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Trott, Arthur F.: *See—*
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Trouiller, Jean C.: *See—*
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Troy, Michael: *See—*
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Trubisky, Leonard G.: *See—*
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True-Lok Inc.: *See—*
Tsamas, Anton, 4,593,440, Cl. 24-265.0WS.

Truitt, Gary A.: *See—*
Partridge, John J.; Shiuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., 4,594,340, Cl. 514-167.000.

Trushell, James B.: *See—*
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Truth Incorporated: *See—*
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TRW Inc.: *See—*
Glorioso, Paul A., 4,594,495, Cl. 219-98.000.

Tsamas, Anton, to True-Lok Inc. Clasp with positive latch mechanism. 4,593,440, Cl. 24-265.0WS.

Tsang, Floris Y.: *See—*
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Tsien, Grace: *See—*
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Tsugiya, Takanori: *See—*
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Tsuji, Yoshitake, to NEC Corporation. Letter pitch detection system. 4,594,732, Cl. 382-9.000.

Tsukamoto, Yasuo: *See—*
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Tsuno, Koichi: *See—*
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Tweed, George C., Jr.; and McCarthy, Richard C., to Otis Elevator Company. Elevator control. 4,594,570, Cl. 340-21.000.

UBE Industries, Ltd.: *See*—
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Ueda, Akiyoshi; Nagasaki, Fumihiko; Takakura, Yutaka; and Kojima, Shigeru, to Nippon Soda Co. Ltd. Process for producing the 3-chloro-1-formyl-4-phenylpyrroles. 4,594,429, Cl. 548-530.000.
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, to Fujisawa Pharmaceutical Co., Ltd. 2-alkoxyimino-3,3-dialkoxy-butyrates and derivatives. 4,594,446, Cl. 560-168.000.
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Ueguri, Shigeo; Tabata, Youichiro; Komura, Hirotsugu; and Ito, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Pulse arc welding machine. 4,594,498, Cl. 219-137.0PS.
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Ulveling, Leon, to Paul Wurth S.A. Apparatus and method for controlling the contents and the filling of a distribution tank for pulverized materials. 4,593,727, Cl. 141-5.000.
Ulveling, Leon, to Paul Wurth S.A. Apparatus and process for the injection of metered amounts of pulverized material into a vessel. 4,594,028, Cl. 406-30.000.
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Union Siderurgique du Nord et de l'Est de la France (USINOR): *See*—
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
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DeYoung, Russell J., 4,594,720, Cl. 372-79.000.
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Fischer, William C.; Verzella, David J.; and Wright, Stuart C., 4,594,714, Cl. 371-62.000.
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Pierce, O. Leon, 4,594,727, Cl. 375-83.000.
Universal Metal Industries: *See*—
Hummel, Roger L., 4,594,515, Cl. 307-252.00B.
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Linley, Francis M., Jr., 4,593,572, Cl. 74-89.150.
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Lundak, Robert L., 4,594,325, Cl. 435-240.000.
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Sharma, Rameshwar K., 4,594,319, Cl. 435-7.000.
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Lewkowicz, Shlomo, 4,594,731, Cl. 381-67.000.
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Hooper, Anthony W.; and Cormack, Alexander D., 4,594,045, Cl. 414-325.000.
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Uno, Takashi, to Nippon Electric Co., Ltd. Power supply circuit for flip-flop memory. 4,594,688, Cl. 365-95.000.
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UOP Inc.: *See*—
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James, Robert B., Jr.; and Carson, Don B., 4,594,144, Cl. 208-62.000.
Polak, Anthony J.; and Beuhler, Allyson J., 4,594,297, Cl. 429-13.000.
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USM Corporation: *See—*
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van der Laarse, Jan D. Double acting oleo pneumatic shock absorber. 4,593,890, Cl. 267-64.250.
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Van Der Weerdt, Antonius J. A., to Naarden International N.V. Perfume compositions and perfumed articles containing one or more tetramethyl-tri-cycloundecyl-alkyl ketones as perfume base. 4,594,183, Cl. 252-522.00R.
van der Wyk, Harry L. Flag or banner pole support bracket. 4,593,877, Cl. 248-512.000.
Vandoros, Steven J. Garment stretcher. 4,593,839, Cl. 223-63.000.
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Van Hatten, David A.; and Nielsen, Herman T., to Control Data Corporation. Demand driven access mechanism. 4,594,590, Cl. 340-825.510.
van Hoof, Leonardus A. H.: *See—*
Stoppels, Doeko; Boonen, Peter G. T.; Enz, Ulrich E.; and van Hoof, Leonardus A. H., 4,594,628, Cl. 360-125.000.
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VanRens, Russell J.; and Bailey, Frank V., to Outboard Marine Corporation. Method of and apparatus for packing sand around a mold pattern by vibration. 4,593,739, Cl. 164-34.000.
Van Vonno, Nicolaas W.; Hull, Richard; and Reinecke, Paul S., to Harris Corporation. Laser trimming of resistors over dielectrically isolated islands. 4,594,265, Cl. 427-53.100.
Vapor Corporation: *See—*
McInerney, Michael J., 4,593,654, Cl. 122-451.200.
Vaqueiro, M. Cristina; and Reyes, Pedro, to Imit, A.C. Process for producing nixtamalized corn flour. 4,594,260, Cl. 426-622.000.
Varga, Istvan K., to Commonwealth of Australia, The. Water purity measurement. 4,594,553, Cl. 324-454.000.
Varsanyi-Breiner, Aviva: *See—*
Gusella, James F.; Housman, David; Keys, Cheryl; Varsanyi-Breiner, Aviva; Puck, Theodore T.; Jones, Carol; and Kao, Fa-Ten, 4,594,318, Cl. 435-6.000.
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Velten, Reinhold: *See—*
Popp, Franz-Wolfgang; and Velten, Reinhold, 4,594,214, Cl. 376-272.000.
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Versichele, Danny H.: *See—*
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Vince, Robert, to Reagents of University of Minnesota. (3-ethoxypropionate) esters of cyclaradine. 4,594,350, Cl. 514-261.000.
Vincent, Robert R. Convertible note pad and pencil sharpener. 4,593,468, Cl. 30-451.000.
Viridian, Inc.: *See—*
Andersen, Erik; Edwards, Robert B., II; and Quinn, David G., 4,594,074, Cl. 604-270.000.
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Viskochil, Stephen R.; and Simons, Brian H., to Priam Corporation. Safety latch for pickup heads and carriage disc drive. 4,594,627, Cl. 360-105.000.
Visocky, Joseph E.; and Ramsay, Charles F., to Plasti-Line, Inc. Menu and prices display device. 4,593,486, Cl. 40-490.000.
Visser, Klaas. Vertical plate freezer apparatus. 4,593,537, Cl. 62-345.000.
Visser, Melvin J.; and Malot, James J., to Upjohn Company, The. Removal of volatile contaminants from the vadose zone of contaminated ground. 4,593,760, Cl. 166-267.000.
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Vitti, Rudolf A.; Burgess, Gary L.; and Zemelman, Valery B., to General Foods Corporation. Product and process using oil for producing an agglomerated instant coffee having a roast and ground appearance. 4,594,258, Cl. 426-594.000.
Vitti, Rudolf A.: *See—*
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Vittone, Andrea; Chiappini, Giuseppe; and Di Paola, Massimo, to Moplefan S.p.A. Process for manufacturing cement plates reinforced with fibrillated polymeric films. 4,594,210, Cl. 264-70.000.
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Voest-Alpine Aktiengesellschaft: *See—*
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Voigt, Carl: *See—*
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Vollmann, Hansjoerg; and Herrmann, Heinz, to Hoechst Aktiengesellschaft. Liquid developer and charge control substance suitable therefor. 4,594,305, Cl. 430-115.000.
Von Roll AG.: *See—*
Elsner, Emil; and Brehmer, Horst, 4,594,113, Cl. 148-12.00B.
von Daehne, Welf, to Leo Pharmaceutical Products. Pharmaceutically-acceptable amine salts of 6-β-halopenicillanic acids. 4,594,246, Cl. 424-114.000.
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Von Kohorn, Henry; Von Kohorn, David; Von Kohorn, Henry; and Von Kohorn, David. Light-reflective device for illuminating centripetally viewed three-dimensional objects. 4,594,646, Cl. 362-101.000.
Von Kohorn, Henry: *See—*
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Vykukal, Hubert C., to United States of America, National Aeronautics and Space Administration. Torso sizing ring construction for hard space suit. 4,593,415, Cl. 2-2.10A.
W. C. Heraeus GmbH: *See—*
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Waasner, Rolf-Dietrich: *See—*
Waasner, Bruno; and Waasner, Rolf-Dietrich, 4,594,295, Cl. 428-581.000.
WABCO Fahrzeugbremsen GmbH: *See—*
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Neuhaus, Detlev; Hesse, Karl-Heinz; Ruhnau, Gerhard; and Liermann, Peter, 4,594,571, Cl. 340-52.00F.
Wackerman, Gunther G., to UNR Industries, Inc. Automatic cleaning gas barbecue grill. 4,593,676, Cl. 126-41.00R.

Wade, R. Morse: *See—*
Guenthner, Russell W.; Shelly, William A.; Presley-Nelson, Gary R.; Marietta, Kala J.; and Wade, R. Morse, 4,594,659, Cl. 364-200.000.

Wade, Stephen E. Time-integrated measurement for determining substances in biological fluids. 4,594,326, Cl. 436-501.000.

Wahle, Gunter; Ludszewcit, Dieter; and Heitmann, Uwe, to Hauni-Werke Korber & Co. KG. Method of and apparatus for building a composite tobacco stream. 4,593,704, Cl. 131-84.300.

Waiser, Shimon. Cross bows. 4,593,675, Cl. 124-25.000.

Waitz, Larry D. Variable weight exercising device. 4,593,903, Cl. 272-122.000.

Walczak, Franciszek: *See—*
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Walker, Louis L.: *See—*
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Walker, Michael S.: *See—*
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Walker, Peter S.: *See—*
McKay, William F.; and Walker, Peter S., 4,593,685, Cl. 128-92.00E.

Wallace, Robert S., to Wright, M. Bosley. Frame routing apparatus. 4,593,734, Cl. 144-136.00R.

Wallace, Steven J.: *See—*
Culley, Paul R.; and Wallace, Steven J., 4,594,501, Cl. 219-492.000.

Wallis, Christopher N., to International Business Machines Corporation. Track following servo system for a disk file. 4,594,622, Cl. 360-77.000.

Walsh, John: *See—*
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Walsh, Michael M.: *See—*
Corey, John A.; and Walsh, Michael M., 4,593,608, Cl. 92-176.000.

Walsh, Thomas J., to General Signal Corporation. One shot pulse width modulating converter. 4,594,578, Cl. 340-347.0AD.

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Walworth, Bryant L.: *See—*
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Wang, Li: *See—*
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Warburg, Joseph H., to Arco Products Corp. Dowel jig. 4,594,032, Cl. 408-115.00R.

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Warner-Lambert Company: *See—*
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Warner-Lambert Technologies, Inc.: *See—*
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Warner & Swasey Company, The: *See—*
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Watanabe, Hiroshi: *See—*
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Watanabe, Kyoichi A.: *See—*
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Watanabe, Takashi: *See—*
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Watanabe, Yoshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic depositing/dispensing apparatus. 4,594,502, Cl. 235-379.000.

Watarai, Shu; and Horie, Seiji, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive hydrazone material. 4,594,304, Cl. 430-59.000.

Watson, Douglas M. Apparatus for making laminated labels. 4,594,125, Cl. 156-516.000.

Watson, Fred L.: *See—*
Brown, David C.; Engebretson, Harold J.; and Watson, Fred L., 4,593,559, Cl. 73-151.000.

Watson, Gary Q., to Morrow Manufacturing Co., Inc. Earth anchor with load plate. 4,593,500, Cl. 52-162.000.

Wattles, Gurdon B.; and Pihl, Donald L., to Safety Railway Service Corporation. Organic fibrous material processing apparatus and system. 4,593,631, Cl. 110-345.000.

Watton, Rex: *See—*
Elliott, Charles T.; Humphreys, Richard G.; and Watton, Rex, 4,594,507, Cl. 250-331.000.

Webb, Terry E.: *See—*
Zaruba, John V.; Baran, Patrick S.; Webb, Terry E.; and Disko, Harry, 4,594,071, Cl. 446-99.000.

Weber, Wilhelm: *See—*
Frisch, David C.; and Weber, Wilhelm, 4,594,311, Cl. 430-315.000.

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Wedemeyer, Karlfried: *See—*
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Wegman, Richard W.; and Miller, Deborah S., to Union Carbide Corporation. Synthesis of aldehydes from alcohols. 4,594,463, Cl. 568-487.000.

Wehr, James R. Tester for lock up torque converters. 4,593,556, Cl. 73-118.000.

Weigel, Matthew J., Jr., to Boeing Company, The. Pneumatic-hydraulic drill unit. 4,594,030, Cl. 408-10.000.

Weil, Eric P.: *See—*
Grassl, Roman; Craig, Thomas A.; and Weil, Eric P., 4,594,487, Cl. 200-82.00E.

Weingartner, Bernhard, to Neutrik Aktiengesellschaft. Method of and apparatus for the stereophonic reproduction of sound in a motor vehicle. 4,594,729, Cl. 381-18.000.

Weir, Donald R.; Kerfoot, Derek E.; and Chalkley, Michael E., to Sherritt Gordon Mines Limited. Recovery of cobalt and nickel from sulphidic material. 4,594,102, Cl. 75-119.000.

Weis, Frank G., to Smith & Loveless, Inc. Sewage pumping station. 4,594,153, Cl. 210-104.000.

Weiss, Jeffrey: *See—*
Hao, Hsieh T.; Ling, Huei; Sachar, Howard E.; Weiss, Jeffrey; and Yamour, Yannis J., 4,594,655, Cl. 364-200.000.

Weiss, Wolfram: *See—*
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Weitz, Hans-Martin: *See—*
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Wells, Larry; and Graham, Karl, to Cummins Engine Company, Inc. Engine valve cover. 4,593,659, Cl. 123-90.380.

Wems/International Controls, Inc.: *See—*
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Wentzek, Horst F.: *See—*
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., 4,593,726, Cl. 140-89.000.
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., 4,593,809, Cl. 198-624.000.

West, Michael D., to International Telephone and Telegraph Corporation. Zone control valve. 4,593,882, Cl. 251-243.000.

Westdeutsche Elektrogeratebau GmbH: *See—*
Brandenberg, Winfried, 4,594,007, Cl. 368-10.000.

Westerwalder Eisenwerk Gerhard GmbH: *See—*
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Westinghouse Electric Corp.: *See—*
Bowman, Dennis C.; and Marlowe, James L., 4,594,475, Cl. 174-152.00R.
Hobgood, Hudson M.; Thomas, Richard N.; and Barrett, Donovan L., 4,594,173, Cl. 252-62.3GA.
Kub, Francis J., 4,594,604, Cl. 357-24.000.
Leone, David A.; and Marks, Douglas C., 4,594,491, Cl. 200-325.000.
Pankowiecki, Joseph, 4,593,526, Cl. 60-657.000.
Panson, Armand J.; and Troy, Michael, 4,594,215, Cl. 376-315.000.
Russell, Robert L., 4,593,505, Cl. 52-221.000.
Snyder, David A.; and Glosecki, David M., 4,593,445, Cl. 29-157.10R.

Weston, C. Harold, Jr.: *See—*
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Wheelabrator-Frye Inc.: *See—*
O'Dell, David L.; and Diehn, Philip H., 4,593,497, Cl. 51-424.000.

Whightsil, Gary L., Sr., to LTV Energy Products Company. Diverter flex joint. 4,593,941, Cl. 285-165.000.

White, Kenneth S. Endotracheal tube including means for patient communication. 4,593,689, Cl. 128-201.190.

Whitehead, Thomas P.; Thorpe, Gary H. G. H.; Kricka, Larry J.; Gibbons, John E. C.; and Bunce, Roger A. Dispensing device and recording apparatus. 4,593,728, Cl. 141-98.000.

Whiteside, George D.: *See—*
Launie, Kenneth J.; and Whiteside, George D., 4,593,983, Cl. 354-217.000.

Wild, Wolfgang; and Landgraf, Gunter, to W. C. Heraeus GmbH. Decorative burnish gold composition. 4,594,107, Cl. 106-1.130.

Wildenau, Wolfgang: *See—*
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Wilder, Don R. Flange assembly for hydraulic power systems. 4,593,940, Cl. 285-158.000.

Wilham, Donald W.; and Rowe, Richard A., to General Electric Company. Electronic touch pad key assembly with stroke amplifier. 4,594,481, Cl. 200-5.00A.

Wilke, Gunther; Sperling, Karin; and Stehling, Ludwig, to Studiengesellschaft Kohle mbH. Process for catalytic dimerization of acrylic acid derivatives. 4,594,447, Cl. 560-202.000.

Wilkinson, James M., II: *See—*
Shanklin, James R., Jr.; and Wilkinson, James M., II, 4,594,343, Cl. 514-212.000.

Will, Malcolm. Covered pill tray and support therefor. 4,593,819, Cl. 206-538.000.
Williams, Marshall, to Ampex Corporation. Signal comparison circuit and phase-locked-loop using same. 4,594,563, Cl. 331-1.00A.
Williams, Robert L.; and Marks, Christopher, to Allied Corporation. Method of making a triaxial electrical connector. 4,593,464, Cl. 29-879.000.
Williams, Ronald H. Wheelchair. 4,593,929, Cl. 280-650.000.
Willis, Donald H., to RCA Corporation. Dedithering circuitry in digital TV receiver. 4,594,726, Cl. 375-26.000.
Wilson, Mildred N.; and Steensen, Wayne L. Sugar-free cheesecake filling and dry mix for preparation thereof. 4,594,255, Cl. 426-578.000.
Wilton, John H.; Hokanson, Gerard C.; and French, James C., to Warner-Lambert Company. CL-1577-B_4 compound, its production and use. 4,594,248, Cl. 424-117.000.
Winckler, Wilhelm: *See—*
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Winfield Corp.: *See—*
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Wink Corporation: *See—*
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Winter, Joseph: *See—*
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,594,117, Cl. 148-414.000.
Wirth, John C. J., Jr. Boring, mortising, tenoning and duplicating woodworking tool. 4,593,735, Cl. 144-144.00R.
Wisconsin Alumni Research Foundation: *See—*
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Wite-Out Products, Inc.: *See—*
Korper, George W., 4,594,014, Cl. 401-115.000.
Witte, Erwin C., to Microdot Inc. Fastener. 4,594,039, Cl. 411-311.000.
Wittkampf, Frederik H. M., to Vitafin N.V. Pacemaker with improved tachycardia treatment means and method. 4,593,695, Cl. 128-419.0PG.
Wolcott, Richard A.: *See—*
Burba, John L., III; and Wolcott, Richard A., 4,594,335, Cl. 502-324.000.
Wolford, Richard P. Tool for crimping a corner bead piece over an exterior plasterboard corner. 4,593,443, Cl. 29-243.500.
Wolpert, George H., Jr.; and Sebest, Albert E., to Spectro Industries, Inc. Telescoping wing nut clamping unit. 4,593,422, Cl. 5-503.000.
Wolters, Gerd-Michael: *See—*
Baring, Rolf; Rudert, Wolfgang; and Wolters, Gerd-Michael, 4,593,662, Cl. 123-198.00F.
Woods, Kenneth D. Air assist delivery system. 4,593,894, Cl. 271-177.000.
Wovkulich, Peter M.: *See—*
Baggiolini, Enrico G.; Uskokovic, Milan R.; and Wovkulich, Peter M., 4,594,432, Cl. 549-214.000.
Wray, Charles: *See—*
Wright, Curtis M.; and Wray, Charles, 4,593,442, Cl. 29-235.000.
Wright, Curtis M.; and Wray, Charles. Cable installation apparatus. 4,593,442, Cl. 29-235.000.
Wright, David A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Deployable coiled rope. 4,593,815, Cl. 206-389.000.
Wright, M. Bosley: *See—*
Wallace, Robert S., 4,593,734, Cl. 144-136.00R.
Wright, Murray J., to Wright Spa Pools Ltd, a part interest. Electrically heated pump for spas and swimming pools. 4,594,500, Cl. 219-296.000.
Wright Spa Pools Ltd: *See—*
Wright, Murray J., 4,594,500, Cl. 219-296.000.
Wright, Stuart C.: *See—*
Fischer, William C.; Verzella, David J.; and Wright, Stuart C., 4,594,714, Cl. 371-62.000.
Wu, Wen-Pao: *See—*
Krutchen, Charles M.; and Wu, Wen-Pao, 4,594,208, Cl. 264-53.000.
Wunderlich Construction Inc.: *See—*
Wunderlich, Max A., Jr.; and Kneifel, Stephen E., 4,594,205, Cl. 264-31.000.
Wunderlich, Max A., Jr.; and Kneifel, Stephen E., to Wunderlich Construction Inc. Method for forming concrete flush floors having integral troughs. 4,594,205, Cl. 264-31.000.
Wurzburg, Henry: *See—*
Merritt, John W.; Wurzburg, Henry; and Kelley, Stephen H., 4,594,707, Cl. 370-91.000.
Xerox Corporation: *See—*
Fox, Wayne D.; and Gheer, Barry J., 4,593,997, Cl. 355-15.000.
Frangesh, Thomas P., 4,594,626, Cl. 360-97.000.
Genovese, Frank C., 4,594,527, Cl. 313-493.000.
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,594,718, Cl. 372-45.000.
Silverberg, Morton, 4,593,897, Cl. 271-212.000.
Yabumoto, Toshiaki: *See—*
Shimizu, Shunji; Watakabe, Yuichi; Fujiwara, Kunihiko; and Yabumoto, Toshiaki, 4,594,298, Cl. 429-72.000.
Yagi, Hiroshi; Fujita, Hisashi; and Harigane, Kotaro, to TDK Corporation. Apparatus for automatically mounting chip-type circuit elements on substrate. 4,593,462, Cl. 29-740.000.
Yagi, Sakai: *See—*
Endo, Takayoshi; Sugiyama, Toshimasa; Murofushi, Satoru; and Yagi, Sakai, 4,593,963, Cl. 339-97.00R.
Yahata, Haruki; and Kobayashi, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Bus-configured local area network with data exchange capability. 4,594,705, Cl. 370-67.000.
Yamada, Osamu; Yanagi, Mikio; Futatsuya, Fumio; and Kobayashi, Kenji, to Nippon Kayaku Kabushiki Kaisha. N-substituted-Δ^1-tetrahydrophthalimide derivatives. 4,594,099, Cl. 71-96.000.
Yamada, Tetsusyo: *See—*
Asayama, Yoshiaki; Yamada, Tetsusyo; and Hirate, Shintaro, 4,594,139, Cl. 204-410.000.
Yamada, Yoshifumi; Tanaka, Kunio; and Abe, Zenwemon, to Utsunomiya University. Method of scanning specifying magnetic field for nuclear magnetic resonance imaging. 4,594,550, Cl. 324-307.000.
Yamagata, Seiichi: *See—*
Ishizuka, Yasuhiro; Nakayama, Takashi; and Yamagata, Seiichi, 4,593,522, Cl. 57-400.000.
Yamaguchi, Masahiko: *See—*
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Gonda, Michihiro; Kanasugi, Mikiko; and Obara, Toshio, 4,594,601, Cl. 346-221.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Aoi, Kazuo; and Ozawa, Toshikazu, 4,593,657, Cl. 123-90.600.
Marier, Gregory J., 4,593,921, Cl. 280-21.00R.
Yamaha Hatsukoki Kabushiki Kaisha: *See—*
Shibata, Hirotaka; and Muramatsu, Takayoshi, 4,593,656, Cl. 123-52.00M.
Yamamoto, Kazumi: *See—*
Haraga, Kousuke; Hattori, Katutoshi; and Yamamoto, Kazumi, 4,594,281, Cl. 428-172.000.
Yamamoto, Makoto: *See—*
Nakayama, Akira; Nakamura, Katsuya; Hata, Kotaro; and Yamamoto, Makoto, 4,594,174, Cl. 252-62.540.
Yamamoto, Minoru; and Sakata, Jiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Gas separating member and method for manufacture thereof. 4,594,079, Cl. 55-158.000.
Yamamoto, Mitsuo; Kinumoto, Namio; Tsuji, Toshinori; and Hiraoka, Tutomu, to Osaka Gas Company. Sealant for internally sealing pipeline. 4,593,722, Cl. 138-145.000.
Yamamoto, Nobuhiro: *See—*
Mikawa, Isao; Endoh, Masahiro; Kaji, Masayuki; Kishida, Yoshitaka; and Yamamoto, Nobuhiro, 4,593,632, Cl. 111-3.000.
Yamamoto, Sadashi; and Ishihara, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Power unit for a vehicle. 4,593,785, Cl. 180-291.000.
Yamamoto, Takashi; Nishida, Kozi; and Tateishi, Akio, to Mitsubishi Rayon Co., Ltd. Plastic optical fiber. 4,593,974, Cl. 350-96.340.
Yamamoto, Tomoichiro, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling a hydraulic elevator. 4,593,792, Cl. 187-29.00B.
Yamasa Shoyu Kabushiki Kaisha: *See—*
Fujishima, Tetsuro, 4,594,320, Cl. 435-89.000.
Fujishima, Tetsuro; and Sakata, Shinji, 4,594,321, Cl. 435-89.000.
Yamasaki, Teiichi; and Takahashi, Yutaka, to Fuji Photo Film Co., Ltd. Film storage device in camera processor. 4,593,867, Cl. 242-181.000.
Yamashita, Shinsuke: *See—*
Kawata, Terushige; and Yamashita, Shinsuke, 4,594,240, Cl. 424-28.000.
Yamasita, Sigeru: *See—*
Morioka, Yuji; Yamasita, Sigeru; and Yano, Yoshiaki, 4,594,300, Cl. 429-225.000.
Yamato Scientific Co., Ltd.: *See—*
Goto, Hideo, 4,594,161, Cl. 210-433.200.
Yamauchi, Hironori: *See—*
Kaneko, Takao; Yamauchi, Hironori; and Iwata, Atsushi, 4,594,687, Cl. 364-900.000.
Yamazaki, Kiyoyasu: *See—*
Hama, Tomio; and Yamazaki, Kiyoyasu, 4,593,943, Cl. 285-308.000.
Yamazaki, Shigeru: *See—*
Noguchi, Takaharu; Yamazaki, Shigeru; and Arai, Takao, 4,594,621, Cl. 360-77.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device. 4,594,471, Cl. 136-249.000.
Yamour, Yannis J.: *See—*
Hao, Hsieh T.; Ling, Huei; Sachar, Howard E.; Weiss, Jeffrey; and Yamour, Yannis J., 4,594,655, Cl. 364-200.000.
Yanagi, Mikio: *See—*
Yamada, Osamu; Yanagi, Mikio; Futatsuya, Fumio; and Kobayashi, Kenji, 4,594,099, Cl. 71-96.000.
Yanagihashi, Kikuji: *See—*
Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,594,062, Cl. 418-173.000.
Yanagishima, Takayuki: *See—*
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,594,583, Cl. 340-576.000.
Yang, Kuo S., to Eli Lilly Company. Crystalline antibiotic salt. 4,594,417, Cl. 544-28.000.
Yano, Tsutomu: *See—*
Hayakawa, Yoshihiro; Nakamura, Yasuhiro; Tachita, Ryobun; and Yano, Tsutomu, 4,593,700, Cl. 128-663.000.
Yano, Yoshiaki: *See—*
Morioka, Yuji; Yamasita, Sigeru; and Yano, Yoshiaki, 4,594,300, Cl. 429-225.000.
Yarborough, John M., Jr., to Signetics Corporation. Frequency detector for use with phase locked loop. 4,594,564, Cl. 331-1.00A.
Yaron , Yitzhak: *See—*
Borde, Irena; and Yaron , Yitzhak, 4,593,538, Cl. 62-490.000.
Yasuda, Mitsuo: *See—*
Nagatomo, Hideaki; and Yasuda, Mitsuo, 4,593,609, Cl. 98-2.010.

Yasuda, Tsutomu: *See*—
Kobayashi, Kenji; Yasuda, Tsutomu; Matsumoto, Hiroshi; and Sone, Humiki, 4,593,701, Cl. 128-667.000.
Yasue, Kazuo, to NEC Corporation. Data transmission device for loop transmission system. 4,594,709, Cl. 371-8.000.
Yasuhara, Seishi, to Nissan Motor Company, Limited. Digital control system. 4,594,667, Cl. 364-431.060.
Yasui, Kuniharu; and Kaneko, Kyoichi, to Daiwa Seiko Inc. Double-bearing fishing reel. 4,593,869, Cl. 242-220.000.
Yasunaga, Toshio: *See*—
Kobayashi, Hiroshi; Yasunaga, Toshio; Muro, Toshihiko; Takeda, Fumio; and Tsuruta, Yutaka, 4,593,499, Cl. 52-126.600.
Yates, David E.: *See*—
Curtin, David J.; and Yates, David E., 4,594,118, Cl. 149-2.000.
Yazaki Corporation: *See*—
Endo, Takayoshi; Sugiyama, Toshimasa; Murofushi, Satoru; and Yagi, Sakai, 4,593,963, Cl. 339-97.00R.
Yazawa, Akio: *See*—
Nara, Akio; Yazawa, Akio; and Akiyama, Yoshinori, 4,593,670, Cl. 123-545.000.
Yeaney, Gerald L.; and Klein, Roy S., to American Sterilizer Company. Wire rack with removable replaceable sleeves. 4,593,822, Cl. 211-41.000.
Yeardley, John K., to Bridon Plc. Rope assemblies. 4,593,599, Cl. 87-6.000.
Yester, Francis R., Jr.: *See*—
Gannon, Mark A.; and Yester, Francis R., Jr., 4,593,460, Cl. 29-602.00R.
Yew, Kwang, to Canadian Fram Limited. Idle restart clutching system. 4,593,798, Cl. 192-0.033.
Yih, Roy Y.: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,594,100, Cl. 71-124.000.
Yocum, Roderick E. Vacuum lifting device. 4,593,947, Cl. 294-64.100.
Yokoyama, Hiroyuki: *See*—
Hashimoto, Tadanori; Yoshitake, Hiroshi; Yokoyama, Hiroyuki; and Nakazono, Akiko, 4,594,182, Cl. 252-518.000.
Yoneno, Hiroshi; Matsuo, Yoshihiro; and Ishihara, Shoichi, to Matsushita Electric Industrial Co., Ltd. Heat insulator. 4,594,279, Cl. 428-69.000.
Yoneya, Sigenori: *See*—
Takahashi, Tsunehiko; and Yoneya, Sigenori, 4,594,596, Cl. 346-76.00L.
Yoshida, Kenichi; Ono, Kimizo; and Tsuno, Koichi, to Sumitomo Electric Industries, Ltd. Composite optical fiber and imaging catheter and method for producing the same. 4,593,973, Cl. 350-96.290.
Yoshida Kogyo K. K.: *See*—
Boser, Ronald J.; and Tanaka, Shigeru, 4,593,635, Cl. 112-265.200.
Yoshida, Kunio, to Sharp Kabushiki Kaisha. Language interpreter for inflecting words from their uninflected forms. 4,594,686, Cl. 364-900.000.
Yoshida, Motoaki: *See*—
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,594,379, Cl. 524-114.000.
Yoshida, Takato; Haraguchi, Soichi; Hongo, Teruaki; and Koide, Yukio, to Hamamatsu University School of Medicine. Augmenting factors for human antibody production and process for peparing the same. 4,594,245, Cl. 424-101.000.
Yoshida, Yoshinobu: *See*—
Furutachi, Nobuo; and Yoshida, Yoshinobu, 4,594,313, Cl. 430-381.000.
Yoshikawa, Kyugo; and Matsuzawa, Tadahiro, to Mitsubishi Gas Chemical Company, Inc. Process for producing aqueous formaldehyde solution. 4,594,457, Cl. 568-473.000.
Yoshiki Industrial Co., Ltd.: *See*—
Yoshizawa, Yasuo, 4,594,675, Cl. 364-558.000.
Yoshinaga, Kenji; and Takada, Yusaku, to Canon Kabushiki Kaisha. Image forming apparatus. 4,593,992, Cl. 355-3.0FU.
Yoshino, Hozo, to System Homes Company, Ltd. Electronic expansion valve. 4,593,881, Cl. 251-124.000.
Yoshino, Muneki; and Tanahashi, Toshitaka, to Nippondenso Co., Ltd. Reverberation sound generator. 4,594,573, Cl. 340-62.000.
Yoshioka, Hiroshi: *See*—
Nemoto, Shoji; and Yoshioka, Hiroshi, 4,594,615, Cl. 360-10.200.
Yoshitake, Hiroshi: *See*—
Hashimoto, Tadanori; Yoshitake, Hiroshi; Yokoyama, Hiroyuki; and Nakazono, Akiko, 4,594,182, Cl. 252-518.000.
Yoshizawa, Yasuo, to Yoshiki Industrial Co., Ltd. Sampling measurement data generation apparatus. 4,594,675, Cl. 364-558.000.
Yu, Ho; Jacoby, John E.; and Ramser, Robert A., to Aluminum Company of America. Fire retardant continuous casting process. 4,593,745, Cl. 164-487.000.
Yuzawa, Yasutaka, to Diesel Kiki Co., Ltd. Injection rate controller for fuel injection pump. 4,593,668, Cl. 123-496.000.
Zahnradfabrik Friedrichshafen, AG: *See*—
Lang, Armin; and Knodler, Helmut, 4,593,718, Cl. 137-596.000.
Zanma, Jun: *See*—
Ohsaki, Kozo; Zanma, Jun; and Watanabe, Hiroshi, 4,594,227, Cl. 422-148.000.
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., to Leggett & Platt, Incorporated. Coil spring assembly machine. 4,593,726, Cl. 140-89.000.
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., to Leggett & Platt, Incorporated. Coil spring assembly machine. 4,593,809, Cl. 198-624.000.
Zaruba, John V.; Baran, Patrick S.; Webb, Terry E.; and Disko, Harry, to Marvin Glass & Associates. Composite toy vehicle assembly. 4,594,071, Cl. 446-99.000.
Zaweski, Edward F.; and Niebylski, Leonard M., to Ethyl Corporation. Fuel compositions. 4,594,077, Cl. 44-57.000.
Zazzu, Victor: *See*—
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,594,560, Cl. 330-296.000.
Zee-Cheng, Robert K.; and Cheng, Chia C., to Warner-Lambert Company. 3,6-disubstituted-1,8-naphthalimides and methods for their production and use. 4,594,346, Cl. 514-237.000.
Zehntel, Inc.: *See*—
Kinsey, Graeme R.; and Riesenberg, William M., 4,593,804, Cl. 193-41.000.
Zeifang, Gunter: *See*—
Kilger, Fridbert; Roth, Siegfried; Breithaupt, Rupert; Menke, Jupp; and Zeifang, Gunter, 4,594,503, Cl. 250-203.00R.
Zemelman, Valery B.; Burgess, Gary L.; Vitti, Rudolf A.; Forman, Todd M.; Batchelor, Anthony M.; and Leblanc, Yvon N., to General Foods Corporation. Product and process for producing an agglomerated instant coffee having a roast ground appearance. 4,594,256, Cl. 426-594.000.
Zemelman, Valery B.: *See*—
Leblanc, Yvon N.; Zemelman, Valery B.; and Burgess, Gary L., 4,594,257, Cl. 426-594.000.
Vitti, Rudolf A.; Burgess, Gary L.; and Zemelman, Valery B., 4,594,258, Cl. 426-594.000.
Zenith Electronics Corporation: *See*—
Chandler, Gregg; and Rajaram, Babu, 4,594,587, Cl. 340-750.000.
Zeugner, Horst: *See*—
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,594,436, Cl. 549-359.000.
Ziegenfus, Barry L.: *See*—
Gutekunst, Stanley K.; Scheel, Russell H.; and Ziegenfus, Barry L., 4,593,623, Cl. 104-166.000.
Ziegler, Walter. Method for testing chemical and biological substances. 4,594,237, Cl. 424-3.000.
Zinnen, Hermann A., to UOP Inc. Separation of picoline isomers. 4,594,423, Cl. 546-353.000.
Zobt, Hartmut: *See*—
Haubner, Georg; Zobt, Hartmut; and Petermann, Hans, 4,594,572, Cl. 340-52.00F.
Zoeke, Siegfried: *See*—
Mair, Eduard; and Zoeke, Siegfried, 4,593,480, Cl. 34-78.000.
Zschocke, Christian; and Forchheim, Hans, to Bauakademie der Deutschen Demokratischen Republik. Continuous-advance hydraulic cable mover. 4,593,884, Cl. 254-264.000.
Zuk, Robert F., to Syntex (U.S.A.) Inc. Assay method for whole blood samples. 4,594,327, Cl. 436-514.000.
Zweifel, Hans: *See*—
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,594,400, Cl. 526-256.000.
Zygo Corporation: *See*—
Sommargren, Gary E., 4,594,003, Cl. 356-349.000.
21st Century Marketing, Inc.: *See*—
Procter, Richard W.; and Anondson, Stanton L., 4,594,249, Cl. 424-125.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JUNE, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Coca-Cola Company, The: *See—*
Sedam, Jason K.; and Fuerst, William R., Re. 32,179, Cl. 261-26.000.

Dorpmund, Heinz: *See—*
Piech, Ferdinand; Dorpmund, Heinz; Oberpilcher, Gerd; Honig, Ernst-August; and Schmidt, Dieter, Re. 32,175, Cl. 74-867.000.

Fuerst, William R.: *See—*
Sedam, Jason K.; and Fuerst, William R., Re. 32,179, Cl. 261-26.000.

Hashimoto, Akihiko; Koiwai, Tamotsu; and Kimura, Toyohiko, to Olympus Optical Company Ltd. Single lens reflex camera. Re. 32,177, Cl. 354-126.000.

Hennion, Claude: *See—*
Lewiner, Jacques; and Hennion, Claude, Re. 32,180, Cl. 340-573.000.

Honig, Ernst-August: *See—*
Piech, Ferdinand; Dorpmund, Heinz; Oberpilcher, Gerd; Honig, Ernst-August; and Schmidt, Dieter, Re. 32,175, Cl. 74-867.000.

Kimura, Toyohiko: *See—*
Hashimoto, Akihiko; Koiwai, Tamotsu; and Kimura, Toyohiko, Re. 32,177, Cl. 354-126.000.

Koiwai, Tamotsu: *See—*
Hashimoto, Akihiko; Koiwai, Tamotsu; and Kimura, Toyohiko, Re. 32,177, Cl. 354-126.000.

LeSuer, William M., to Lubrizol Corporation, The. Combination of hydroxy amines and carboxylic dispersants as fuel additives. Re. 32,174, Cl. 44-70.000.

Lewiner, Jacques; and Hennion, Claude. Composite sheets constituting electromechanical transducers and transducers equipped with such sheets. Re. 32,180, Cl. 340-573.000.

Lloyd, Ronald B.; and Wick, Gerald H., to Outboard Marine Corporation. Lawn mower brake and clutch device. Re. 32,173, Cl. 56-113.000.

Lubrizol Corporation, The: *See—*
LeSuer, William M., Re. 32,174, Cl. 44-70.000.

Mitsubishi Denki K.K.: *See—*
Yoshizaki, Kiyoshi, Re. 32,178, Cl. 148-11.50P.

Oberpilcher, Gerd: *See—*
Piech, Ferdinand; Dorpmund, Heinz; Oberpilcher, Gerd; Honig, Ernst-August; and Schmidt, Dieter, Re. 32,175, Cl. 74-867.000.

Olympus Optical Company Ltd.: *See—*
Hashimoto, Akihiko; Koiwai, Tamotsu; and Kimura, Toyohiko, Re. 32,177, Cl. 354-126.000.

Outboard Marine Corporation: *See—*
Lloyd, Ronald B.; and Wick, Gerald H., Re. 32,173, Cl. 56-113.000.

Piech, Ferdinand; Dorpmund, Heinz; Oberpilcher, Gerd; Honig, Ernst-August; and Schmidt, Dieter, to Volkswagenwerk Aktiengesellschaft. (Pneumatic) hydraulic control system for an automatic vehicle transmission. Re. 32,175, Cl. 74-867.000.

Schmidt, Dieter: *See—*
Piech, Ferdinand; Dorpmund, Heinz; Oberpilcher, Gerd; Honig, Ernst-August; and Schmidt, Dieter, Re. 32,175, Cl. 74-867.000.

Sedam, Jason K.; and Fuerst, William R., to Coca-Cola Company, The. Post-mix beverage dispensing system syrup package, valving system, and carbonator therefor. Re. 32,179, Cl. 261-26.000.

Vernon, Richard L. Unitized aircraft food and beverage service. Re. 32,176, Cl. 244-118.500.

Volkswagenwerk Aktiengesellschaft: *See—*
Piech, Ferdinand; Dorpmund, Heinz; Oberpilcher, Gerd; Honig, Ernst-August; and Schmidt, Dieter, Re. 32,175, Cl. 74-867.000.

Wick, Gerald H.: *See—*
Lloyd, Ronald B.; and Wick, Gerald H., Re. 32,173, Cl. 56-113.000.

Yoshizaki, Kiyoshi, to Mitsubishi Denki K.K. Process for producing compound based superconductor wire. Re. 32,178, Cl. 148-11.50P.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bell, Ted A.; and Lehner, Daniel F., to Pretty Products, Inc. Automobile splash guard and attachment means therefor. B1 4,293,140, 6-10-86, Cl. 280-154.50R.

Carmichael, Donald C.: *See—*
Chambers, Douglas L.; Carmichael, Donald C.; and Wan, Chong T., B1 3,826,728, Cl. 204-192.00P.

Chambers, Douglas L.; Carmichael, Donald C.; and Wan, Chong T., to Shatterproof Glass Corporation. Transparent article having reduced solar radiation transmittance and method of making the same. B1 3,826,728, 6-10-86, Cl. 204-192.00P.

Daicel Chemical Industries, Ltd.: *See—*
Toga, Yuzo; Shimada, Toshio; and Komada, Hajime, B1 4,381,379, Cl. 525-444.000.

Hashimoto Corp.: *See—*
Uehara, Zenshiro, B1 4,189,079, Cl. 226-188.000.

Ingro, Ben. Wall climbing devices. B1 3,810,515, 6-10-86, Cl. 180-54.200.

Komada, Hajime: *See—*
Toga, Yuzo; Shimada, Toshio; and Komada, Hajime, B1 4,381,379, Cl. 525-444.000.

Lehner, Daniel F.: *See—*
Bell, Ted A.; and Lehner, Daniel F., B1 4,293,140, Cl. 280-154.50R.

Ogden, Cameron A.: *See—*
Tench, Dennis M.; and Ogden, Cameron A., B1 4,132,605, Cl. 204-1.00T.

Pretty Products, Inc.: *See—*
Bell, Ted A.; and Lehner, Daniel F., B1 4,293,140, Cl. 280-154.50R.

Rockwell International Corporation: *See—*
Tench, Dennis M.; and Ogden, Cameron A., B1 4,132,605, Cl. 204-1.00T.

Shatterproof Glass Corporation: *See—*
Chambers, Douglas L.; Carmichael, Donald C.; and Wan, Chong T., B1 3,826,728, Cl. 204-192.00P.

Shimada, Toshio: *See—*
Toga, Yuzo; Shimada, Toshio; and Komada, Hajime, B1 4,381,379, Cl. 525-444.000.

Tench, Dennis M.; and Ogden, Cameron A., to Rockwell International Corporation. Method for evaluating the quality of electroplating baths. B1 4,132,605, 6-10-86, Cl. 204-1.00T.

Toga, Yuzo; Shimada, Toshio; and Komada, Hajime, to Daicel Chemical Industries, Ltd. Polyester containing 2-methyl-1,3-propylene terephthalate units. B1 4,381,379, 6-10-86, Cl. 525-444.000.

Uehara, Zenshiro, to Hashimoto Corp. Controllable drive for tape recorder. B1 4,189,079, 6-10-86, Cl. 226-188.000.

Wan, Chong T.: *See—*
Chambers, Douglas L.; Carmichael, Donald C.; and Wan, Chong T., B1 3,826,728, Cl. 204-192.00P.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Kerkut, Gerald, 284,221, Cl. D24-51.000.

Abe, Karl H., to Bayerische Motoren Werke AG. Combined motorcycle fairing and rear view mirror direction indicator units. 284,180, 6-10-86, Cl. D12-182.000.

Abe, Karl H., to Bayerische Motoren Werke AG. Upper fairing for motorcycles. 284,181, 6-10-86, Cl. D12-182.000.

ABECO Limited: *See*—
Bieganski, Zdzislaw, 284,163, Cl. D8-99.000.

Adler, Carlo, to Bijouterie Adler S.A. Wrist watch. 284,169, 6-10-86, Cl. D10-32.000.

Airway Industries, Inc.: *See*—
Kim, Hyun S., 284,137, Cl. D3-76.000.
Kim, Hyun S., 284,138, Cl. D3-76.000.
Kim, Hyun S., 284,140, Cl. D3-76.000.

American Commercial, Incorporated: *See*—
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Takeuchi, Akitaka; Sakamoto, Motoaki; Yamagami, Yoku; and Onuma, Shoichi, 284,189, Cl. D14-58.000.
Yamaguchi, Kazuyuki: *See*—
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Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, 284,178, Cl. D12-147.000.
Yeaw, Harold D.: *See*—
Davis, Myron F.; Jordan, Willis Y., III; Syler, Robert L.; and Yeaw, Harold D., 284,195, Cl. D14-114.000.
Yokoyama, Nagakazu: *See*—
Kondo, Hideaki; Kadota, Shinsuke; Ohta, Keizou; Nakatani, Takeshi; and Yokoyama, Nagakazu, 284,188, Cl. D14-58.000.

CLASSIFICATION OF PATENTS

ISSUED JUNE 10, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2.1 A 4,593,415
24 4,593,416
209.1 4,593,417
275 4,593,418

CLASS 4

324 4,593,419
496 4,593,420
507 4,593,421

CLASS 5

503 4,593,422

CLASS 8

499 4,594,075

CLASS 12

145 4,593,423

CLASS 14

71.7 4,593,424

CLASS 15

53 AB 4,593,425
84 4,593,426
227 4,593,427
248 A 4,593,428
353 4,593,429

CLASS 16

121 4,593,430
381 4,593,431

CLASS 17

46 4,593,432
49 4,593,433
4,593,434
52 4,593,435

CLASS 19

105 4,593,436
113 4,593,437
261 4,593,438

CLASS 24

197 4,593,439
265 WS 4,593,440
297 4,593,441

CLASS 29

27 C 4,593,444
157 R 4,593,446
157.1 R 4,593,445
235 4,593,442
241 4,593,447
243.5 4,593,443
523 4,593,448
527.1 4,593,449
559 4,593,450
560 4,593,451
564.6 4,593,452
571 4,593,453
4,593,454
572 4,593,455
573 4,593,456
576 B 4,593,457
576 W 4,593,458
577 C 4,593,459
602 R 4,593,460
623.1 4,593,461
740 4,593,462
879 4,593,464
884 4,593,463

CLASS 30

240 4,593,465
272 A 4,593,466
300 4,593,467
451 4,593,468

CLASS 33

1 CC 4,593,470
1 M 4,593,469
125 C 4,593,472
125 T 4,593,471
169 R 4,593,473
264 4,593,474
347 4,593,475
529 4,593,476

CLASS 34

10 4,593,477
57 R 4,593,478
58 4,593,479
78 4,593,480
133 4,593,481

CLASS 36

7.5 4,593,482
119 4,593,483

CLASS 37

195 4,593,484

CLASS 40

452 4,593,485
490 4,593,486

CLASS 42

7 4,593,487
75 C 4,593,488

CLASS 43

137 4,593,489

CLASS 44

6 4,594,076
57 4,594,077
70 Re.32,174

CLASS 47

79 4,593,490

CLASS 48

111 4,594,078

CLASS 49

13 4,593,491
57 4,593,492
248 4,593,493
374 4,593,494

CLASS 51

118 4,593,495
4,593,496
424 4,593,497

CLASS 52

18 4,593,498
126.6 4,593,499
162 4,593,500
167 4,593,501
4,593,502
188 4,593,503
199 4,593,504
221 4,593,505
4,593,506
4,593,507
239 4,593,508
262 4,593,509
314 4,593,510
404 4,593,511
519 4,593,512
578 4,593,513
648 4,593,514

CLASS 53

56 4,593,515
75 4,593,516
441 4,593,517
556 4,593,518

CLASS 55

158 4,594,079
179 4,594,080
222 4,594,081
316 4,594,082
385 BR 4,594,083

CLASS 56

113 Re.32,173
328 R 4,593,519
400.06 4,593,520

CLASS 57

328 4,593,521
400 4,593,522

CLASS 60

39.281 4,593,523
289 4,593,524
606 4,593,525
657 4,593,526
660 4,593,527
673 4,593,528

CLASS 62

3 4,593,529
5 4,594,084
25 4,594,085
55.5 4,593,530
101 4,593,531
119 4,593,532
140 4,593,533
201 4,593,534
217 4,593,535
239 4,593,536
345 4,593,537
490 4,593,538
504 4,593,539

CLASS 63

12 4,593,540

CLASS 65

1 4,594,087
3.4 4,594,088
4.4 4,594,086
135 4,594,089

CLASS 70

57 4,593,541
134 4,593,542
4,593,543
264 4,593,544
269 4,593,545
380 4,593,546

CLASS 71

29 4,594,090
67 4,594,091
77 4,594,092
86 4,594,098
87 4,594,093
88 4,594,094
92 4,594,095
93 4,594,096
4,594,097
96 4,594,099
124 4,594,100

CLASS 72

1 4,593,547
12 4,593,548
4,593,549
199 4,593,550
240 4,593,551
255 4,593,552

CLASS 73

35 4,593,553
49.3 4,593,554
116 4,593,555
118 4,593,556
146 4,593,557
147 4,593,558
151 4,593,559
155 4,593,560
170 A 4,593,561
266 4,593,562
432 R 4,593,563
473 4,593,564
601 4,593,565
623 4,593,568
643 4,593,567
660 4,593,566
864.67 4,593,570

CLASS 74

89.15 4,593,572
89.2 4,593,571
104 4,593,573
198 4,593,574
421 A 4,593,575
424.8 B 4,593,576
493 4,593,577
498 4,593,578
571 R 4,593,579
858 4,593,580
866 4,593,581
4,593,582
867 Re.32,175

CLASS 75

0.5 C 4,594,101
119 4,594,102
128 C 4,594,103
243 4,594,104
257 4,594,105
636 4,593,569

CLASS 81

57.14 4,593,583
57.18 4,593,584
98 4,593,585

CLASS 82

14 A 4,593,586
32 4,593,587
40 R 4,593,588

CLASS 83

168 4,593,589
438 4,593,590
834 4,593,591

CLASS 84

21 4,593,592
177 4,593,593
185 4,593,594
317 4,593,595
421 4,593,596
487 4,593,597

CLASS 86

36 4,593,598

CLASS 87

6 4,593,599

CLASS 89

1.813 4,593,602
33.1 4,593,600
199 4,593,601

CLASS 91

265 4,593,603
504 4,593,604
528 4,593,605

CLASS 92

52 4,593,606
130 B 4,593,607
176 4,593,608

CLASS 98

2.01 4,593,609
74 4,593,610

CLASS 99

277.1 4,593,611
277.2 4,593,612
427 4,593,613
538 4,593,614

CLASS 100

227 4,593,615

CLASS 101

163 4,593,616
350 4,593,617
375 4,593,618
409 4,593,619

CLASS 102

372 4,593,620
430 4,593,621
530 4,593,622

CLASS 104

166 4,593,623
172 B 4,593,624

CLASS 105

182 R 4,593,625

CLASS 106

1.12 4,594,106
1.13 4,594,107
170 4,594,108
271 4,594,109

CLASS 108

4 4,593,626

CLASS 109

83 4,593,627

CLASS 110

101 R 4,593,628
172 4,593,629
245 4,593,630
345 4,593,631

CLASS 111

3 4,593,632

CLASS 112

121.11 4,593,633
262.3 4,593,634
265.2 4,593,635
308 4,593,636

CLASS 114

20 R 4,593,637
39 4,593,638
103 4,593,639
123 4,593,640
343 4,593,641
347 4,593,642

CLASS 118

72 4,593,643
719 4,593,644

CLASS 119

1 4,593,645
4,593,646
2 4,593,647
3 4,593,648
14.08 4,593,649
15 4,593,650
52 B 4,593,651

CLASS 122

4 D 4,593,652
365 4,593,653
451.2 4,593,654

CLASS 123

41.77 4,593,655
52 M 4,593,656
90.11 4,593,658
90.38 4,593,659
90.6 4,593,657
193 P 4,593,660
196 AB 4,593,661
198 F 4,593,662
440 4,593,663
446 4,593,664
478 4,593,665
480 4,593,666
488 4,593,667
496 4,593,668
502 4,593,669
545 4,593,670
568 4,593,672
572 4,593,671

CLASS 124

20 B 4,593,673
23 R 4,593,674
25 4,593,675

CLASS 126

41 R 4,593,676
214 C 4,593,677
427 4,593,678

CLASS 127

31 4,594,110

CLASS 128

4 4,593,679
4,593,680
4,593,681
6 4,593,682
23 4,593,683
75 4,593,684
92 E 4,593,685
136 4,593,686
200.26 4,593,687
200.28 4,593,688
201.19 4,593,689
207.15 4,593,690
303.14 4,593,691
327 4,593,692
334 R 4,593,693
354 4,593,694
419 PG 4,593,695
419 R 4,593,696
538 4,593,697
644 4,593,698
660 4,593,699
663 4,593,700
667 4,593,701
696 4,593,702
748 4,593,703

CLASS 131

84.3 4,593,704
84.4 4,593,705
109.1 4,593,706
336 4,593,707

CLASS 132

9 4,593,708

CLASS 133

3 D 4,593,709

CLASS 134

3 4,594,111

CLASS 135

102 4,593,710

CLASS 136

246 4,594,470
249 4,594,471

CLASS 137

39 4,593,711
106 4,593,712
322 4,593,713
371 4,593,714
503 4,593,715
556.6 4,593,717
561 A 4,593,716
596 4,593,718
625.66 4,593,719
859 4,593,720

CLASS 138

118.1 4,593,721
145 4,593,722

CLASS 139

65 4,593,723
188 R 4,593,724
304 4,593,725

CLASS 140

89 4,593,726

CLASS 141

5 4,593,727
98 4,593,728
218 4,593,729
258 4,593,730

CLASS 144

1 A 4,593,731
2 Z 4,593,732
34 R 4,593,733
136 R 4,593,734
144 R 4,593,735

CLASS 148

6.14 R 4,594,112
11.5 P Re.32,178
12 B 4,594,113
4,594,115
12 EA 4,594,114
12.7 C 4,594,116
414 4,594,117

CLASS 149

2 4,594,118

CLASS 150

147 4,593,736

CLASS 156

94 4,594,119
155 4,594,120
158 4,594,121
433 4,594,122
456 4,594,123
468 4,594,124
516 4,594,125
608 4,594,126
617 R 4,594,127
622 4,594,128
630 4,594,129

CLASS 160

84 R 4,593,737
176 R 4,593,738

CLASS 162

16 4,594,130

CLASS 164

34 4,593,739
44 4,593,740
337 4,593,741
415 4,593,742

416 4,593,743
448 4,593,744
487 4,593,745
495 4,593,746
496 4,593,747

CLASS 165

1 4,593,748
4,593,749
9 4,593,750
9.1 4,593,751
48.1 4,593,752
51 4,593,753
109.1 4,593,754
145 4,593,755
151 4,593,756
162 4,593,757

CLASS 166

65.1 4,593,758
261 4,593,759
267 4,593,760
268 4,593,761
275 4,593,762
302 4,593,763
312 4,593,764
387 4,593,765

CLASS 171

63 4,593,766

CLASS 173

98 4,593,767
116 4,593,768
145 4,593,769

CLASS 174

35 GC 4,594,472
68.5 4,594,473
88 C 4,594,474
152 R 4,594,475

CLASS 175

45 4,593,770
48 4,593,771
53 4,593,772
85 4,593,773
107 4,593,774
228 4,593,775
375 4,593,776
379 4,593,777

CLASS 177

185 4,593,778

CLASS 179

6.08 4,594,476
18 AD 4,594,477
103 4,594,478
170.2 4,594,479
175.3 R 4,594,480

CLASS 180

54.2 B1 3,810,515
65.4 4,593,779
79.1 4,593,780
4,593,781
88 4,593,782
141 4,593,783
291 4,593,785
4,593,786

CLASS 181

144 4,593,784

CLASS 182

3 4,593,787
4,593,788
142 4,593,789
214 4,593,790

CLASS 187

9 E 4,593,791
29 B 4,593,792
56 4,593,793
95 4,593,794

CLASS 188

71.3 4,593,795
77 R 4,593,796
196 D 4,593,797

CLASS 192

0.033 4,593,798
46 4,593,799
56 R 4,593,800
70.15 4,593,801
107 M 4,593,802
112 4,593,803

CLASS 193

41 4,593,804

CLASS 198

369 4,593,806
381 4,593,805
457 4,593,807
570 4,593,808
624 4,593,809
781 4,593,810
842 4,593,811

CLASS 200

5 A 4,594,481
4,594,482
6 B 4,594,483
16 A 4,594,484
61.45 R 4,594,485
61.54 4,594,486
82 E 4,594,487
148 R 4,594,488
151 4,594,489
248 4,594,490
325 4,594,491

CLASS 203

26 4,594,131

CLASS 204

1 T B1 4,132,605
105 R 4,594,132
158.1 4,594,133
180.1 4,594,135
181.7 4,594,136
192 P B1 3,826,728
192 SP 4,594,137
302 4,594,138
410 4,594,139

CLASS 206

292 4,593,812
328 4,593,813
387 4,593,814
389 4,593,815
425 4,593,816
457 4,593,817
503 4,593,818
538 4,593,819

CLASS 208

33 4,594,142
46 4,594,143
62 4,594,144
79 4,594,145
111 4,594,146
207 4,594,147
332 4,594,148
390 4,594,141
414 4,594,140

CLASS 209

1 4,594,149
166 4,594,150
4,594,151
273 4,594,152
573 4,593,820
620 4,593,821

CLASS 210

104 4,594,153
105 4,594,154
107 4,594,166
115 4,594,155
145 4,594,156
163 4,594,157
193 4,594,158
198.2 4,594,159
222 4,594,160
433.2 4,594,161
493.1 4,594,162
660 4,594,163
741 4,594,164
767 4,594,165

CLASS 211

41 4,593,822
49.1 4,593,823
57.1 4,593,824
126 4,593,825
187 4,593,826

CLASS 213

50 4,593,827
62 A 4,593,828
75 R 4,593,829

CLASS 215

256 4,593,830

CLASS 219

10.55 E 4,594,492
56.22 4,594,493
86.8 4,594,494
98 4,594,495
121 PP 4,594,496
130.21 4,594,497
137 PS 4,594,498
221 4,594,499
296 4,594,500
492 4,594,501

CLASS 220

1.5 4,593,831
4,593,832
94 R 4,593,833
273 4,593,834

CLASS 222

131 4,593,835
136 4,593,836
288 4,593,837
607 4,593,838

CLASS 223

63 4,593,839

CLASS 224

42.03 A 4,593,840
153 4,593,841
179 4,593,842

CLASS 226

188 B1 4,189,079

CLASS 227

19 4,593,843
67 4,593,844
117 4,593,845
130 4,593,846
155 4,593,847

CLASS 228

2 4,593,848
29 4,593,849
47 4,593,850
248 4,593,851

CLASS 235

379 4,594,502

CLASS 237

12.3 A 4,593,852
56 4,593,853

CLASS 239

14 4,593,854
74 4,593,855
83 4,593,856
109 4,593,857
126 4,593,858

CLASS 241

20 4,593,859
23 4,593,860
46.02 4,593,861
88 4,593,862
92 4,593,863

CLASS 242

56.9 4,593,864
67.1 R 4,593,865
84.52 B 4,593,866
181 4,593,867
199 4,593,868
220 4,593,869

CLASS 244

117 R 4,593,870
118.5 Re.32,176
129.1 4,593,871

CLASS 248

98 4,593,873
156 4,593,872
188.4 4,593,874
429 4,593,875
469 4,593,876
512 4,593,877
549 4,593,878
624 4,593,879

CLASS 249

91 4,593,880

CLASS 250

203 R 4,594,503
227 4,594,504
229 4,594,505
288 4,594,506
331 4,594,507
334 4,594,508
338 4,594,509
339 4,594,510
4,594,511
384 4,594,512
506.1 4,594,513
556 4,594,514

CLASS 251

124 4,593,881
243 4,593,882

CLASS 252

3 4,594,167
8.5 C 4,594,168
4,594,169
8.55 R 4,594,173
49.6 4,594,171
55 4,594,172
62.3 GA 4,594,173
62.54 4,594,174
99 4,594,175
153 4,594,176
194 4,594,177
301.17 4,594,179
301.4 P 4,594,178
500 4,594,180
512 4,594,181
518 4,594,182
522 R 4,594,183
542 4,594,184
551 4,594,185
628 4,594,186

CLASS 254

7 B 4,593,883
264 4,593,884
277 4,593,885

CLASS 260

239 A 4,594,189
239.3 P 4,594,191
239.3 R 4,594,190
397.2 4,594,192
399 4,594,193
428 4,594,194
502.4 R 4,594,199
512 R 4,594,200

CLASS 261

18 B 4,594,201
26 Re.32,179

CLASS 264

8 4,594,202
22 4,594,203
25 4,594,204
31 4,594,205
35 4,594,206
41 4,594,207
53 4,594,208
66 4,594,209
70 4,594,210
141 4,594,211
163 4,594,212
211 4,594,213

CLASS 266

44 4,593,886
48 4,593,887
70 4,593,888

CLASS 267

57.1 A 4,593,889
64.25 4,593,890
140.1 4,593,891

CLASS 269

244 4,593,892

CLASS 270

52.5 4,593,893

CLASS 271

148 4,593,895
177 4,593,894
186 4,593,896
212 4,593,897

CLASS 272

73 4,593,898
75 4,593,899
76 4,593,900
78 4,593,901
93 4,593,902
122 4,593,903

CLASS 273

1 E 4,593,904
73 D 4,593,905
129 R 4,593,906
153 S 4,593,907
4,593,908
188 R 4,593,909
273 4,593,910
322 4,593,911
339 4,593,912
420 4,593,913

CLASS 277

5 4,593,914
12 4,593,915
4,593,916
30 4,593,917
96.1 4,593,918

CLASS 279

4 4,593,919

CLASS 280

6 R 4,593,920
21 R 4,593,921
33.99 A 4,593,922
154.5 R B1 4,293,140
261 4,593,923
279 4,593,924
493 4,593,925
603 4,593,926
615 4,593,927
625 4,593,928
650 4,593,929
690 4,593,930
714 4,593,931
765.1 4,593,932
812 4,593,933

CLASS 281

45 4,593,934

CLASS 282

28 R 4,593,935

CLASS 283

112 4,593,936

CLASS 285

18 4,593,937
22 4,593,938
137.1 4,593,939
158 4,593,940
165 4,593,941
253 4,593,942
308 4,593,943
321 4,593,944

CLASS 292

201 4,593,945
288 4,593,946

CLASS 294

64.1 4,593,947
88 4,593,948

CLASS 296

204 4,593,949

CLASS 297

3 4,593,950
347 4,593,951
365 4,593,952

CLASS 301

6 CS 4,593,953

CLASS 303

7 4,593,954
106 4,593,955

CLASS 307

252 B 4,594,515
269 4,594,516
296 R 4,594,517
350 4,594,518
443 4,594,519

CLASS 310

12 4,594,520
15 4,594,521
42 4,594,522
4,594,523
68 R 4,594,524
156 4,594,525
317 4,594,526

CLASS 313

493 4,594,527
503 4,594,528
571 4,594,529

CLASS 315

5.41 4,594,530
307 4,594,531
331 4,594,532
363 4,594,533
408 4,594,534

CLASS 318

254 4,594,535
561 4,594,536
564 4,594,537
565 4,594,538
640 4,594,539
661 4,594,540

CLASS 323

288 4,594,541

CLASS 334

62 4,594,542
72 4,594,543
73 AT 4,594,544
103 R 4,594,545
122 4,594,546
141 4,594,547
208 4,594,548
232 4,594,549
307 4,594,550
341 4,594,551
375 4,594,552
454 4,594,553

CLASS 328

268 4,594,554

CLASS 329

135 4,594,555
137 4,594,556
160 4,594,557

CLASS 330

9 4,594,558
149 4,594,559
296 4,594,560
297 4,594,561
307 4,594,562

CLASS 331

1 A 4,594,563
4,594,564
108 A 4,594,565

CLASS 333

219 4,594,566

CLASS 335

16 4,594,567
289 4,594,568

CLASS 338

35 4,594,569

CLASS 339

17 C 4,593,959
17 D 4,593,958
42 4,593,960
61 M 4,593,961
94 M 4,593,962
97 R 4,593,963
177 R 4,593,964
192 R 4,593,965
205 4,593,966

CLASS 340

21 4,594,570
52 F 4,594,571
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62 4,594,573
71 4,594,574
347 AD 4,594,575
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347 DA 4,594,577
347 SY 4,594,579
521 4,594,580
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573 Re.32,180
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750 4,594,587
771 4,594,588
805 4,594,589
825.07 4,594,591
825.51 4,594,590
959 4,594,592

CLASS 343

5 CM 4,594,593
389 4,594,594
770 4,594,595

CLASS 346

76 L 4,594,596
76 PH 4,594,597
140 R 4,594,598
160 4,594,599
4,594,600
221 4,594,601

CLASS 350

3.71 4,593,967
96.15 4,593,968
96.19 4,593,969
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260 4,593,976
339 F 4,593,977
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514 4,593,979
529 4,593,980

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CLASS 354

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324 4,593,986
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3 R 4,593,989
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3 SC 4,593,994
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55 4,593,999

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119 4,594,609
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36.1 4,594,616
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125 4,594,628
128 4,594,629

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20 4,594,631
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58 4,594,650

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16 4,594,710
25 4,594,711
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35 4,594,716
38 4,594,717
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9 4,594,732
50 4,594,733

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266 4,594,015

CLASS 402

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CLASS 403

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43 4,594,018
246 4,594,019
343 4,594,020

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14 4,594,021
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127 4,594,024
147 4,594,025
153 4,594,026
154 4,594,027

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121 B 4,594,052
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55 4,594,061
173 4,594,062

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4 4,594,218
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451.9 4,594,067

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307 4,594,252
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578 4,594,255
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622 4,594,260

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225 4,594,300
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157 4,594,069

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311 4,594,419

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353 4,594,423

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193 4,594,467

CLASS 585

310 4,594,468
511 4,594,469

CLASS 604

187 4,594,073
270 4,594,074

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D2—	408	284,133		498	284,150		397	284,165			284,181	D16—	6	284,197		151	284,213
D3—	34	284,134		521	284,152	D9—	367	284,166		211	284,182	D17—	20	284,198	D24—	8	284,214
	37	284,135		596	284,151		398	284,167		314	284,183	D18—	2	284,199		17	284,215
	71	284,136		604	284,139		415	284,168	D13—	10	284,184		7	284,200		23	284,216
	76	284,137	D7—	13	284,153	D10—	32	284,169		24	284,185			284,201		26	284,217
		284,138			284,154			284,170	D14—	5	284,186			284,202		27	284,218
		284,140			284,155		118	284,171		52	284,187	D19—	62	284,203		28	284,219
D6—	316	284,141		22	284,156			284,172		58	284,188		76	284,204		48	284,220
	334	284,142		38	284,157			284,173			284,189		90	284,205		51	284,221
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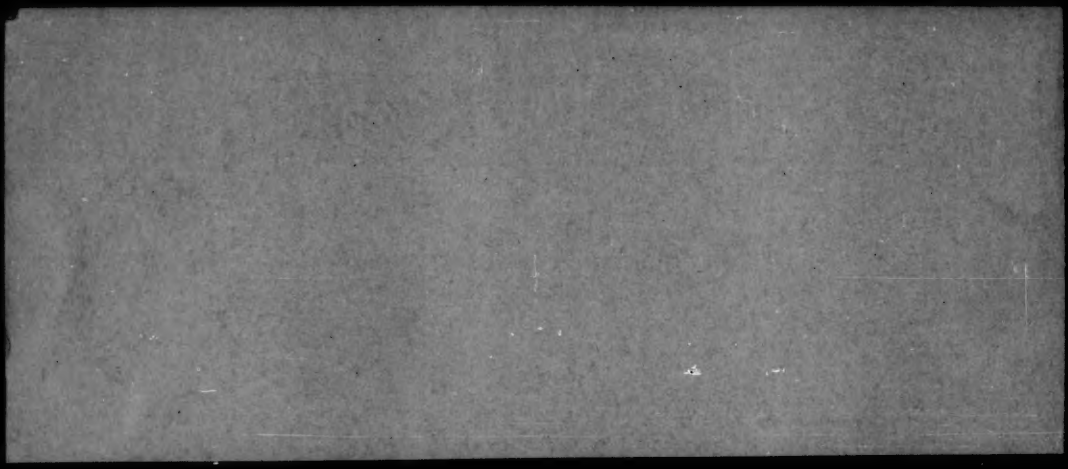

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Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
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